DEPARTMENT OF AGRICULTURE AND TECHNICAL
INSTRUCTION FOR IRELAND.

REPORT

OF

PROCEEDINGS

UNDER

THE FERTILISERS AND FEEDING STUFFS ACT, 1906,

AND UNDER

PART II. OF THE WEEDS AND AGRICULTURAL SEEDS (IRELAND) ACT, 1909,

FOR THE YEAR

1910-11.

Presented to both Houses of Parliament by Command of His Majesty.

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To

His Excellency JOHN CAMPBELL, EARL OF ABERDEEN,

Lord Lieutenant-General and General Governor of Ireland.

MAY IT PLEASE YOUR EXCELLENCY,

I am directed by the Vice-President to submit to Your Excellency the Report of Proceedings under the Fertilisers and Feeding Stuffs Act, 1906, for the year ended 30th September, 1911.

I have the honour to remain,

Your Excellency's faithful Servant,

T. P. GILL,
Secretary.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION STREET,
DUBLIN, *5th June*, 1912.

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Dublin Castle,

7th June, 1912.

Sir,

I have to acknowledge the receipt of your letter of the 5th instant, forwarding, for submission to His Excellency the Lord Lieutenant, the Report of Proceedings under the Fertilisers and Feeding Stuffs Act, 1906, and Part II. of the Weeds and Agricultural Seeds (Ireland) Act, 1909, for the year 1910-11.

I am,

Sir,

Your obedient Servant,

J. B. DOUGHERTY.

The Secretary,

Department of Agriculture

and Technical Instruction,

Dublin.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

PROCEEDINGS UNDER THE FERTILISERS AND FEEDING STUFFS ACT, 1906, AND UNDER PART II. OF THE WEEDS AND AGRICULTURAL SEEDS (IRELAND) ACT, 1909.

STATEMENT FOR THE YEAR ENDED 30TH SEPTEMBER, 1911.

In view of the interest aroused by the issue in 1909 and 1910 of reports of the proceedings taken by the Department under the provisions of the Fertilisers and Feeding Stuffs Act, 1906, and in the hope that the publication of a detailed account of a further year's working of this Act in Ireland will be of assistance to traders and farmers generally, the following statement has been prepared of the work performed by the Department in this connection during the period from October, 1910, to September, 1911.

As a general rule in this country, vendors of fertilisers and feeding stuffs are engaged also in the sale of agricultural seeds. For this reason it is considered desirable that there should be incorporated in this report a record of the action taken by the Department during the same period under the provisions of Part II. of the Weeds and Agricultural Seeds (Ireland) Act, 1909, which came into operation on the 1st January, 1910. The object of this measure briefly is to enable the Department to exercise over the trade in agricultural seeds a supervision as effective as that exercised by them under the Fertilisers and Feeding Stuffs Act in the case of artificial manures and feeding stuffs.

Much useful work was accomplished in the spring of 1910 by the employment of special officers who devoted their whole time to the making of enquiries as to the nature of the manures, feeding stuffs, and seeds imported into or offered for sale throughout the country. In such instances as they thought necessary samples were taken by them and submitted to the Department for examination. These officers were detailed to undertake similar duties during the early months of 1911, and there is reason to believe that the work carried out by them and by the other official samplers of the Department is largely responsible for the improvement which is apparent in the quality of the fertilisers now available for use by farmers in this country.

I.—SAMPLING.

During the past year there were submitted to the Department by their official samplers throughout the country 505 samples of fertilisers, 342 of feeding stuffs, and 1,784 of agricultural seeds, all of which were carefully examined. Of these 243 fertilisers, 239 feeding stuffs, and 682 samples of seeds were analysed or tested. A return showing the number of samples drawn by the official samplers resident in each county will be found at page 30.

The Department are glad to note from the reports of their samplers that a marked change is now apparent in the attitude of the local merchants and traders towards the Department in their administration of the Fertilisers and Feeding Stuffs Act. For the first few years after the Act came into operation traders regarded the action of the Department in causing samples to be taken on their premises as an unjustifiable interference in their business, inspired by a desire to discover some fault in the quality of their goods, or in their methods of business. This feeling made the work of the samplers in the beginning very difficult and unpleasant, but, by the exercise of patience and tact in the discharge of their duties, they have succeeded, to a large extent, in removing this prejudice from the minds of the traders. Once the latter were made to understand clearly that the Department's action was solely to improve the condition of the trade in these commodities, and to protect farmers and others against fraud, the feeling of distrust gave place to one of confidence in the good intentions of the Department. It is now an event of the rarest occurrence for a trader to place any obstacle in the way of a sampler desiring to examine the manures or feeding stuffs on his premises; on the other hand, the visits of the samplers are looked forward to by many merchants as opportunities for obtaining further information on subjects relating to their business. Indeed, the spirit of enquiry on the part of the traders which has of late been manifest in many parts of the country is one of the most hopeful signs of a general improvement in the condition of the trade. To meet this demand for information the Department are prepared to form classes of instruction at convenient centres. Up to the present the lack of teachers has prevented them from organizing as many classes of this nature as they could wish, but this difficulty has been to some extent overcome, and most successful classes have already been held at Cork, Westport, Tralee, Sligo, New Ross, and Athlone.

Arrangements are being made for the holding of further classes at suitable centres, and the Department will be glad to receive applications from traders desirous of having classes formed in their neighbourhood. The instruction given is of a simple and practical character and covers the following ground:—

Description of the Principal Manures—Value of (1) Nitrogen,

(2) Phosphates, (3) Potash.—Valuation of compound manures by unit method.—Manures suited for the various farm crops.—Making up mixtures to certain analyses.—Manures which should not be mixed.—Manures of good-keeping qualities and manures which deteriorate.—Application of Fertilisers and Feeding Stuffs Act to sale of manures.—Giving of invoices.—Misleading methods of stating analyses.

Feeding Stuffs.—Composition of the principal cattle foods.—Comparative valuation of different food-stuffs by determination of total food units.—Examination of cakes and meals for impurities and adulterants.—Compound cakes.—Home-grown food-stuffs.—Application of Fertilisers and Feeding Stuffs Act to sale of feeding stuffs.—Invoices.

Seeds.—Properties of good seed.—Effects of age on seed.—Comparison of fresh and old seed, heavy and light seed.—Identification of the more important grass seeds, and points of difference.—Identification of principal impurities and adulterants.—Methods of testing.—Germination tests.—Ascertaining true value of samples from percentages of purity and germination.—Department's method of testing compared with that adopted at Continental Stations. Weeds and Agricultural Seeds (Ireland) Act.

II.—INVOICES.

In previous reports considerable stress was laid by the Department on the importance of the provisions of the Fertilisers and Feeding Stuffs Act relative to the giving of proper invoices in connection with the sale of artificial manures and feeding stuffs. The action taken by the Department to bring home to traders their responsibilities in this respect has effected a decided improvement in the matter of compliance with the requirements of the Act, especially on the part of wholesale and the larger retail traders. A number of instances, however, of failure, especially on the part of small local traders, to fulfil their obligations in regard to the giving of invoices, came under notice, but, as it appeared on investigation that this remissness arose through lack of knowledge on the subject, the Department did not consider it necessary in any of these cases to have recourse to the institution of legal proceedings under the Act. Several traders were of the opinion that it was not necessary for them to supply invoices, unless requested to do so by the purchaser, while others asserted that the manufacturers' description on the bag was a sufficient guarantee. As a rule, a letter from the Department, or a visit from their official sampler, had the effect of clearing up any misapprehension on these points, and led to the prescribed invoices being given.

Reference was made in last year's report to the dismissal of a case brought by the Department against a firm in Birmingham for failure to give the prescribed invoice in connection with the sale of a parcel of calf meal to a farmer in this country. The grounds of the dismissal were that the Department were not empowered to initiate proceedings under the Act in Great Britain without having previously obtained the consent of the Board of Agriculture and Fisheries. From this decision the Department appealed, and a case was stated for hearing by the High Court of Justice, King's Bench Division, by whom it was held that the decision of the magistrate was correct in law, and that the consent of the Board of Agriculture and Fisheries was a necessary precedent to the institution of legal proceedings in Great Britain under Section 6 of the Act.

As some doubt appears to exist on the subject, it may be well to point out here that the provisions of the Weeds and Agricultural Seeds (Ireland) Act do not render it obligatory on the part of a vendor of agricultural seeds to give to his customers invoices stating the guaranteed percentages of purity and germination of the seeds he is selling. Most of the principal firms in the trade in Ireland have, however, intimated to the Department their willingness to give statements of these particulars in respect of the seeds sold by them. The Department have compiled a list of these firms which they supply to any farmers desiring it. Retailers of agricultural seeds and farmers are recommended to purchase their seeds only under cover of such statements, especially in the case of grass and clover seeds. They should also insist that the particulars are based on tests carried out at the Department's Seed Testing Station, or at places where their methods of testing are employed.

Purchasers are often misled by the apparently high results of germination tests made according to the methods in vogue at continental stations where *selected* seed only is used for the germination test. At the Department's station the seed is tested for germination just as it is supplied to the trader or farmer, only the real impurities, such as dirt, weed seeds, etc., being first eliminated.

It should also be remembered that the value for agricultural purposes of a sample cannot be judged from a consideration of its germination percentage alone; the percentage of purity must also be taken into account, and the true value calculated from these data on the method set forth in the Department's leaflet 59.

III.—FERTILISERS.

The Department issued again last season a schedule of unit prices for use in the comparison of the approximate commercial values of manures. A copy of the schedule will be found at page 31. In view of the advance in the prices of sulphate of ammonia and other nitrogenous materials the unit price of nitrogen was raised to 15*s*., an increase of 1*s*. on the unit price for the preceding year. The unit prices of the other constituents remained unchanged. These prices should be used only in the valuation of manures composed of high-class materials such as sulphate of ammonia, nitrate of soda, superphosphate, and the well-known potash salts of proved merit. They should not, therefore, be applied in the case of low-grade compounds, usually described as organic manures, and manufactured from shoddy and phosphates in a form not readily available as plant food. The unit value of the small quantities of nitrogen and phosphates generally found in the latter "manures," even when they are worthy of valuation, would be very considerably less than the respective values of the nitrogen and phosphates present in a high-grade compound.

Analysis of Samples.

Of the 243 samples of artificial manures tested by the Department during the year, invoices and full particulars were given in respect of the consignments from which they were taken in 205 cases, and of these 150 (*i.e.*, 73·2%) were found to be up to guarantee, 35 (*i.e.*, 17%) were found to be deficient within the limits of error allowed under the Fertilisers and Feeding Stuffs (Ireland) Regulations, 1910, and 20 (*i.e.*, 9·8%) were found to be deficient beyond these limits. A selection representative of the manures tested, with the results of analysis in each case, will be found at page 39.

On consideration of the foregoing figures it will be seen that the improvement, referred to in last year's report, in the quality of the fertilisers sold in this country is being maintained. The Department are glad to note an increasing demand for the manure mixtures recommended by them for the several farm crops. Numerous samples of these manures taken at various places throughout the country from consignments supplied by the leading Irish manufacturers were tested by the Department, and were found in every instance to be up to guarantee, in excellent condition, and good value for the prices charged. An increasingly large number of farmers purchase the several constituents of these mixtures separately, and prepare them on their own premises as recommended in the memorandum (A. B. No. 8) issued by the Department on the subject.

Low-Grade Compound Manures.

Blood and Bone Manure, etc.—A marked decrease has been apparent of late years in the number of firms who, by means of travelling agents, carry on a trade in this country in the sale, at exorbitant prices, of low-grade compounds described as "Blood and Bone Manure," "Blood, Bone and Meat Compound," etc. Three or four years ago there were at least a dozen firms of this class trading in Ireland; at present, so far as the Department are aware, there are not more than three.

It had apparently become increasingly difficult for one of these firms to dispose of the worthless products formerly sold by them under the above-mentioned titles, and their agents have latterly been found trying to obtain orders from small farmers in the poorer districts of the country for the same class of stuff, but now described as "General Manure" and stated to be good for all crops.

Another firm evidently found it more advantageous last season to appear in certain districts under a different name from that under which they had formerly carried on business there. Accordingly, in some parts of the country their manures were sold as the product of the original firm, whilst in districts where their manures had been sold in previous years the new name of the firm was employed.

The trade in manures of this inferior quality is almost exclusively carried on by travelling agents employed by the manufacturers whose headquarters, in every instance, are at Liverpool. The qualifications of these agents to advise farmers and to engage in a business requiring technical knowledge and experience are not apparent, as amongst their number are included ex-policemen, ex-postmen, a bankrupt draper, a town official, etc.

In conducting their business these men call on farmers, and by misrepresentation of the value of the manures they are selling, as well as by untruthful statements as to farmers of standing in the district using the compounds, obtain orders for supplies of these stuffs. Promises of long credit, testimonials purporting to emanate from well-known agriculturists, and the production of a sample of strong-smelling manure are some of the further means employed by these agents to extract orders from credulous farmers.

When visiting a farmer a second year in the hope of obtaining a repeat order different tactics are employed by the agents. They are generally met with complaints about the unsatisfactory results of the use of the manure in the previous season. Various kinds of excuses are given to explain away these results, and the manures at present being offered are guaranteed to be the best ever put on sale.

One instance related by a farmer to an officer of the Department may be quoted as illustrating the methods employed to meet farmers' complaints as to the poor results obtained by using these compounds. The farmer in question protested to the agent that, though he had applied a heavy dressing of "Blood and Bone Compound" sold him by the agent, his oat crop had been a failure. The agent enquired how the manure had been applied; on being informed that it had been sown broadcast by hand, the ground receiving two strokes of the harrow afterwards, he at once explained that in order to obtain the desired effect from that particular manure the ground should have received one or two strokes more.

Another ruse adopted by agents of the same firm is to sell to a farmer during the autumn or early winter some high-class basic slag at a cheap rate. On calling round again on some future occasion they are able to use the fact of good results having followed the use of the slag as an argument to persuade the farmer to order a supply of their compound manure, the use of which, they guarantee, will produce equally satisfactory results.

The farmers who were so unfortunate as to be deluded into purchasing these stuffs discovered, however, at harvest time their worthless character as manures, and in many places they declined to pay for them.

In one such instance in Tipperary a Liverpool firm processed in the County Court eleven farmers who had refused to pay for manure of this kind, and who counterclaimed for loss sustained by reason of the breach of an express and implied warranty that the manure was reasonably fit for growing crops. During the hearing of the case evidence was given by the several defendants as to the losses sustained by them as a result of their applying the manure to their crops. Several of them had used it side by side in their fields with other manures obtained locally at equal cost, one of whom testified that from the land to which he had applied the latter manure he had a crop of 24 tons of turnips to the acre, whilst where the "general" manure was used a return of 2 tons only to the acre was obtained, though the agent who persuaded him to try this stuff had stated that it was specially good for turnips.

Evidence of a like nature was given by other farmers, and the county agricultural instructor, who attended as a witness in the case, gave particulars of an experiment carried out by him with the manure on one of the farms. In this experiment two quarter-acre plots were taken side by side, one of which was treated with the "general" manure at the rate of 16 cwt. per Irish acre, the other, with a mixture recommended by him and obtained locally, consisting of sulphate of ammonia, superphosphate, and kainit, applied at the rate of 13 cwt. per Irish acre. The cost of the manuring was: on the first plot £3 10*s.* 5*d.*, and on the second £3 13*s.* per acre. The produce of the two plots was carefully weighed, and showed the following results: from the plot on which "general" manure had been used, 11 tons 7 cwts.; from the other plot, 23 tons 11½ cwts. per Irish acre. Taking the value of the turnips and the cost of labour, etc., into account, the instructor found that the plot on which the mixture recommended by him had been used showed a substantial profit, whilst that to which the other stuff had been applied showed an actual *loss*. This proved very clearly that, not only was the manure worthless for turnip growing, but that the farmers suffered considerable loss of winter fodder for their stock. Evidence was given by the Department's Analyst, based on the results of his analysis of samples of the "general" manure, as to its unsuitability for turnips, or any other crop. He also demonstrated the exorbitance of the price (£4 per ton) charged for the manure, 75 per cent. of which consisted of worthless material. After a full hearing the County Court Judge dismissed the Company's claim in each case, with costs and witnesses' expenses.

A short time subsequently, another Liverpool firm, trading in this country by means of travelling agents, processed a farmer in the same county for non-payment of the amount charged for a consignment of Bone and Meat Compound which he had used for his crops with the usual disappointing results. Warned, apparently, by the result of the case above-mentioned the Company were not represented in court when their case came up for hearing, and their claim was consequently dismissed.

It should be mentioned that the foregoing cases were defended under sec. 53 of the Sale of Goods Act, 1893, which provides that :—

> "(1) Where there is a breach of warranty by the seller, or where the buyer elects, or is compelled, to treat any breach of a condition on the part of the seller as a breach of warranty, the buyer is not by reason only of such breach of warranty entitled to reject the goods : but he may (*a*) set up against the seller the breach of warranty in diminution or extinction of the price. . . . ."

The warranty, of which a breach was held to have been committed in these cases, is that referred to in Section 14 (1) of the same Act :—

> "Where the buyer, expressly or by implication, makes known to the seller the particular purpose for which the goods are required, so as to show that the buyer relies on the seller's skill or judgment, and the goods are of a description which it is in the course of the seller's business to supply (whether he be the manufacturer or not), there is an implied condition that the goods shall be reasonably fit for such purpose."

In dealing with the question of the sale of manures of this description the Department, in anticipation of the occurrence of cases such as those detailed above, have had numerous field experiments conducted, and have caused the closest inquiry to be made in regard to the methods adopted in pushing the sale of such goods. They desire, therefore, to warn firms engaged in this trade that, in the event of legal proceedings arising out of the sale of their products in Ireland, the Department will deem it their duty to lay before the Court the facts in their possession relating to these firms, and to their products.

Bone Manure.—The attention of the Department was directed to the circulars issued by an English manufacturing firm relative to a certain bone manure sold by them, in which it was stated that this fertiliser was suitable for all purposes, was made entirely from bone, and contained phosphates (practically all soluble) 52%, ammonia 1·5%, and sulphate of potash 3%. The results of analysis made by the Department's Analys showed that the manure in question was not made entirely from bone, and that its composition was: Total phosphates 44·12%, soluble phosphates *nil*, citric soluble phosphates 34·35%, nitrogen 1·89%, and potash ·92%. A communication was accordingly addressed to the firm by the Department pointing out these facts and the misleading character of this circular, and, as a result, an undertaking was given by the manufacturers to amend their circular in these respects in future.

IV.—FEEDING STUFFS.

ANALYSIS OF SAMPLES.

In last year's report it was pointed out that the condition of the trade in feeding stuffs in Ireland could not be regarded as satisfactory. Increased attention was therefore given by the Department during the period under review to the taking and testing of samples of these commodities. In all 342 samples were received and examined by the Department, and of these 239 were analysed, an increase of 68 on the number tested during the corresponding period of last year. Of the number tested in respect of which guarantees of content of oil and albuminoids were given, 38 per cent. were found to be up to the guaranteed standard, 44 per cent. were found to be deficient within the limits allowed under the Fertilisers and Feeding Stuffs (I.) Regulations, and 18 per cent. were found to be deficient beyond those limits.

COMPOUND FEEDING CAKES AND MEALS.

Whilst the Department are glad to note an increasing demand all over the country for linseed and cotton cakes of the best quality, they regret to observe that a considerable trade is still carried on in the distribution of compound feeding cakes and meals of very inferior quality. The trade in these commodities is generally conducted by travelling agents who visit the farms and obtain orders by the use of the same methods of misrepresentation as are employed by them in procuring orders for the compound manures.

Numerous samples of these inferior feeding stuffs, described under various titles, such as fattening cake, feeding cake, milk meal, milk food, condimented food, dairy meal, calf meal, pig meal, etc., have been procured by the Department and examined by their Analyst. In almost every instance the reports of his investigations indicate the worthless nature of the ingredients employed in the manufacture of these stuffs. Warehouse sweepings, screenings from seed merchants' stocks, weed seeds, inferior and damaged rice-meal and linseed cake meal, oat dust and oat shudes, chaff, etc., figured largely in their composition. To these in some cases a little feeding material of some value was added, and the whole sweetened with sugar or locust bean, or flavoured with some spice, to make it palatable to the animals for which it was intended. Owing to the nature of their composition it could not be expected that the keeping qualities of these compounds would be otherwise than bad, and the samples examined were almost invariably found to be stale and dirty, and in many of them numbers of mites and maggots were present.

The firms engaged in the manufacture and sale of these stuffs are apparently well acquainted with the provisions of the Fertilisers and Feeding Stuffs Act, and know exactly how far they can pursue their operations without rendering themselves liable to criminal prosecution under that measure. They are very careful, therefore, as a rule to give invoices as required by the Act, and the compounds they sell contain the guaranteed percentages of oil and albuminoids. Several cases, however, came under the notice of the Department during the past year in which it was clear that the requirements of the Act had been infringed, and proceedings were accordingly instituted by the Department against the offending firms.

The first of these cases was brought under the notice of the Department by farmers of standing in Counties Cork and Limerick, who reported that quantities of a feeding meal, which they had reason to believe was practically worthless, had been sold to a number of small farmers in those counties by travelling agents of a Manchester firm. These farmers further alleged that proper invoices, as required by the Fertilisers and Feeding Stuffs Act, had not been supplied by the firm in connection with the sales. Samples were taken by the Department's official samplers from different consignments of the meal, and, on being tested, showed that it was considerably below its guaranteed composition as stated in the manufacturers' price list. Arrangements were accordingly made for the purchase by a farmer in Co. Limerick of a cwt. of the meal direct from the manufacturers. Some six weeks after the order had been given the meal was delivered to the farmer. About a week previous to the delivery he had received an invoice which did not comply with the requirements of the Act, inasmuch as it stated merely the quantity and price of the meal supplied. A sample was taken in accordance with the requirements of the Act and Regulations by the Department's official Sampler, and was tested by the Agricultural Analyst for the County and by the Chief Agricultural Analyst for Ireland, respectively, each of whom certified that the meal was considerably below the guaranteed composition, as given in the manufacturers' price list, in respect of content of oil. The Chief Analyst further reported that the meal consisted almost entirely of rice bran, there being also present small quantities of linseed cake meal, oatmeal, and foenugreek. The market price of the principal ingredient of the meal being from 7*s.* to 8*s.* 6*d.* per cwt., whilst the price charged for the meal itself was 17*s.* 6*d.* per cwt., it will be seen that the latter amount was out of all proportion to the value of the stuff.

Proceedings were accordingly instituted by the Department against the firm on the following charges: (*a*) failure to give the invoice required by the Act, (*b*) causing or permitting a description of the feeding stuff sold by them to be false in a material particular to the prejudice of the purchaser.

On the hearing of the case at Liverpool the stipendiary magistrate decided to convict on both counts, and imposed fines amounting to £10, with £10 10*s*. costs.

It transpired during the proceedings that the firm had been in existence for a year only, and that most of its sales had been effected in Ireland. An experiment carried out subsequently by the Instructor in Agriculture for County Limerick showed that the meal supplied was quite unsuitable for calf-rearing.

Early in the present year the Department became aware that sales were being effected in the north of Ireland of a feeding stuff for cattle sold as a proprietary article, and described as a well-balanced mixture of pure germ oil cakes and molasses. Samples were taken from different consignments and examined by the Department's Analyst, who reported that the stuff was below its guaranteed composition in respect of oil, and that it was composed of rice bran, sugar, and linseed cake meal, together with an appreciable quantity of saw-dust, weed seeds, and limestone. Steps were immediately taken for the purchase by a farmer in County Antrim of a supply of the stuff in question direct from the manufacturers in Glasgow. Samples were duly drawn from the parcels supplied, and were tested by the analytical officers as required by the Act. In his report on the portion analysed by him the Chief Agricultural Analyst for Ireland certified that the feeding stuff was deficient from its guaranteed standard in respect of content of oil, albuminoids, and sugar, and that it contained ingredients, viz.: 3·5% carbonate of lime, and 10% of sawdust, worthless for feeding purposes, and not disclosed in the invoice, and that these ingredients were present to an extent materially prejudicial to the purchaser. The Department, in consequence, took proceedings under the Act against the manufacturers, and the case was tried in the Sheriff Court, Glasgow. Evidence was given by the Chief Agricultural Analyst for Ireland in support of the charge. For the defence it was alleged that sawdust had not been used in the manufacture of the food, that owing to the nature of some of the constituents the percentage of oil could only be given approximately, and that carbonate of lime was introduced on account of its bone-forming qualities. A local analytical chemist who had examined portion of the sample testified that he had found no sawdust in it, but that there was present 10·4 per cent. of crude fibre, which, in his opinion, was not excessive. He also differed to a slight extent from the reports as to content of oil certified by the County Analyst and Chief Agricultural Analyst for Ireland.

The Sheriff, in giving his decision, said that he was bound to find that the invoice was false in one particular—that of content of oil in the food. The discrepancy in albuminoids was within the limit allowed by the Act. He thought it safer not to convict on the portion of the charge referring to deficiencies of carbohydrates and sugar. He disliked, however, very much the way in which the ingredients were stated in the invoice. In regard to the second charge, he could not find it proved that there was 10 per cent. of sawdust, or any sawdust, because the only evidence in support of that view was the evidence of a single witness (the Chief Agricultural Analyst for Ireland), and, however good that witness might be, he could not accept his evidence, when it was challenged, without confirmation. He must find that carbonate of lime was added, and that it had not been proved that it was a food for stock. He found both charges proven, but to a limited extent, and imposed a fine of £7 10*s.* on each charge, or £15 in all.

CALF MEALS.

In pursuing their enquiries in regard to the sale of calf meals described as having been prepared in accordance with the directions given in leaflet 54, the Department had under investigation a case in which it appeared at first sight that an inferior mixture was being passed off for the meal recommended by the Department, which should be composed of 2 parts by weight of oatmeal, 2 parts of maize meal, and 1 part of pure ground flax-seed. A sample of a meal stated to be of this composition was taken in the stores of a co-operative society in the north of Ireland by an official sampler, and submitted to the Department for analysis. On being examined by their Analyst it was found not to be composed entirely of the ingredients recommended by the Department. The Department, accordingly, made enquiries into the matter, and were informed by the society that the meal they had ordered from the manufacturers, and with which they had believed they were being supplied during the four or five preceding years, was the mixture prepared as recommended in leaflet 54. Arrangements were then made for the society to order a further consignment of the meal from the manufacturers. The order asked that it should be prepared according to the usual formula, which was quoted. On receipt of the consignment it was sampled by the Department's official sampler in accordance with the requirements of the Act and Regulations. In his report on the portion of the sample examined by him, the Chief Agricultural Analyst for Ireland stated that, in his opinion, the meal supplied contained about one-half its weight of linseed cake meal. No statement of the percentage of oil and albuminoids contained was made on the invoice given by the manufacturers to the society. It therefore appeared that the manufacturers had not only supplied a mixture inferior to that which had been ordered, but had also committed a breach of section 1 (2) of the Act in failing to state the percentages of oil and albuminoids con-

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tained in the meal. The Department were accordingly considering the question of instituting criminal proceedings under the Act against the firm when a communication was received from them stating that the meal supplied had been prepared in accordance with a prescription supplied to them some years previously by the chairman of the society which specified that, in addition to the three constituents recommended by the Department, the calf meal should contain half its weight of linseed cake meal. The firm further asserted that it was their practice to attach to invoices, given in connection with the feeding stuffs sold by them, gummed slips stating the percentages of oil and albuminoids contained in the foods. A representative of the Department called upon the manufacturers, and, after a most careful examination of their books and records, was satisfied that their statement as to the prescription originally supplied to them by the society for the preparation of the meal was correct. Further, it was evident from their records that they had more than once informed the society that the meal they were supplying to them was not that recommended by the Department, and had endeavoured, without success, to induce the society to take the latter preparation. The failure of the firm to supply the mixture asked for in the order which the society gave them at the request of the Department arose from the fact that this order asked for a meal prepared after the "usual formula," and the firm in consequence supplied the mixture in accordance with their previous custom, overlooking the fact that the formula set forth in this particular order form was different from that originally given to them by the society. The firm admitted that they had not been in the habit of supplying this society with invoices stating the percentages of oil and albuminoids in the meal as they did not think this was necessary when it had been prepared according to a formula supplied by the society. On reviewing the whole facts as above stated the Department were of opinion that it was not a case in which criminal proceedings should be taken, and, on receiving an undertaking from the firm that they would in future comply strictly with the requirements of the Act with regard to the giving of invoices, they decided to take no further action in the matter.

MISCELLANEOUS FEEDING STUFFS.

(*a*) ***Hop Food***.—From time to time during the past three years the Department have had to bring the requirements of the Act under the notice of a certain firm of hop food specialists, whose principal works were in Manchester, with branch offices and mills in Ireland. Section 1 (2) of the Act requires that there shall be given, in connection with the sale of any feeding stuff prepared otherwise than by being mixed, broken, ground, or chopped, an invoice stating the actual percentages of oil and albuminoids contained in the article. It is, however, specially provided in sub-section 6 that where such an article consists of two or more ingredients which have been mixed at the request of the purchaser, it shall be a sufficient compliance with the provisions of the section with respect to percentages if the invoice contains a statement of percentages with respect to the several ingredients before mixture, and a statement that they have been mixed at the request of the purchaser.

This provision clearly applies only to foods the several ingredients of which, as well as the proportions in which they are to be mixed, are known to the purchaser. It could not, therefore, be held to apply to a proprietary article the ingredients and methods of preparation of which are a trade secret. The company above referred to sought, nevertheless, to evade the requirements of sub-section 2 by taking an unjustifiable advantage of the special provisions of sub-section 6, and gave on the invoices, relating to their preparations, the analysis, not of the finished article, but of the dry ingredients, together with the statement that they had been mixed at the request of the purchaser. The analyses of the dry ingredients were almost twice as great as those of the complete preparation as sold to purchasers. The average farmer would, therefore, be led by such an invoice to believe he was obtaining an article in which were double the nutritive ingredients it actually contained. The Department had under consideration the question of instituting proceedings against the firm for this infringement of the requirements of section 1 (2) of the Act, but, after some correspondence, they accepted from the firm their statement that they would give in future on their invoices the analysis of the complete article, and no further action was taken in the matter. The method adopted by the firm to carry out their undertaking was to attach a gummed slip containing the analysis of the finished article to an invoice form on which were still printed the old analysis of the dry ingredients, and the statement as to the mixture being made at the request of the purchaser. This arrangement did not prove satisfactory, and the Department had to enter into further correspondence with the firm, as a result of which the latter discontinued this practice, and issued invoices on which were printed the analysis of the completed article.

As however several cases subsequently came under the notice of the Department in which feeding stuffs supplied by this firm were found to be below their guaranteed composition, the Department decided to prosecute the manufacturers in question. In the particular instance in which proceedings were taken the manufacturers had supplied to a farmer in County Cavan a quantity of a feeding stuff described as hog-meal, which proved on analysis to be deficient in respect of content of oil and albuminoids to the extent of about 3 and 5 per cent. respectively.

On learning that proceedings were being taken in the matter a director of the firm wrote to the farmer stating that it was not hog-meal, as ordered by him and invoiced, that had been supplied, but that a part preparation of another meal had been sent to him in error. On review, however, of all the facts known to the Department in relation to this firm, they could not accept this explanation as satisfactory, and, on the case being heard in the Dublin Police Court, a fine of £2 with £10 costs was imposed.

(*b*) *Wheat Meal.*—A sample of a feeding stuff described as pure feeding wheat meal, tested by the Department early in the summer of 1911, was found to be composed chiefly of wheat bran, rice meal, and weed seeds, and to be deficient in content of oil and albuminoids. A parcel of this meal was ordered from the manufacturers in Belfast and supplied to one of the Department's country stations. Samples from the lot supplied proved on analysis to be of the same composition as the first lot sampled. The Department brought the matter under the notice of the firm, who informed them that the stuff in question was ground wheat screenings, and that they had ceased to invoice it as pure feeding wheat meal. On receiving their undertaking to invoice the stuff in future merely as "feeding wheat meal," and to comply with the requirements of the Act as to statement of content of oil and albuminoids, etc., on invoices, the Department decided not to take any further action in the case.

(*c*) *Decorticated Cotton Cake.*—Several samples of this feeding stuff tested by the Department were found to be unfit for feeding purposes, either by reason of staleness of condition, or of excessive content of cotton wool. The attention of the vendor in each case was directed to the circumstance, and he was advised to withdraw from sale any portion of the consignment remaining on hands.

In one instance a stock-breeder alleged that on feeding his cattle with a certain brand of cotton cake, obtained from a Liverpool firm, the stock became ill, lost condition, and finally refused to touch it at all. On its being omitted from their rations they began to thrive again. Samples of the cake were most exhaustively examined by the Department's Analyst, who failed to discover any foreign ingredient likely to have caused the illness of the animals. In view of it being alleged that somewhat similar results followed the use of cotton cake in other instances the Department consider the matter to be one for special research. Farmers and stock breeders would be well advised to exercise particular care and discretion in the purchase of cotton cake (or meal), and should satisfy themselves that it is in sweet and fresh condition, and does not contain an excess of cotton wool or fibre. They should also be careful not to use it as a feeding stuff for young stock, either by itself or, as in one case which came under the notice of the Department recently, as an ingredient in the preparation of a calf meal.

(*d*) *Bleached Bran.*—It has come to the knowledge of the Department that bran sold in considerable quantities in Ireland as white bran, *i.e.*, the bran of white wheat, is in reality red bran, or the bran of red wheat, which has been bleached by a chemical or electrolytic process, so as to make it pass for the former article. Many farmers prefer white to red bran for stock-feeding purposes, and are willing to pay from £2 to £3 per ton more for the white variety. It is evident, therefore, that the selling of red bran, bleached at the cost of a few shillings per ton, as white bran, is a very profitable business for the manufacturer.

The Department directed the County Agricultural Instructors to impress upon farmers the necessity of exercising great care in the purchase of brans for stock-feeding purposes. In cases in which they are not satisfied as to the origin of white bran offered to them farmers would be well advised to use red bran in preference, especially in view of the fact that the higher price commanded by white in comparison with red bran is not, in the opinion of the Department, justified by any greater feeding value possessed by the former article. The results of numerous analyses show that, while the composition of individual brans often varies within certain limits, the average composition of red bran is practically identical with that of white bran. Some preliminary tests also tend to show that red bran is quite as good as white bran for feeding to any class of stock.

V.—APPOINTMENT OF ANALYSTS.

One change only occurred during the year in the *personnel* of the County Agricultural Analysts—Mr. J. Harold Totton, B.Sc., F.I.C., having been appointed temporarily for one year to fill the vacancy in County Londonderry occasioned by the decease of Mr. R. Barklie, F.C.S.

VI.—AGRICULTURAL SEEDS.

The Weeds and Agricultural Seeds (Ireland) Act, 1909, was introduced into the House of Commons by the Vice-President of the Department in the Session of 1909 and, having passed through both Houses, came into operation on the 1st of January, 1910.

The Act is divided into three parts, of which the first deals with the destruction of noxious weeds, the second with the sale of agricultural seeds, and the third is general. A note of the proceedings taken by the Department under Part I. of the Act is contained in the Annual General Report of the Department. A brief summary of the action taken by them in accordance with the provisions of Part II. is here given.

In December, 1909, before the measure actually came into operation, the Department addressed a circular-letter to every trader in Ireland engaged in the sale of agricultural seeds. In this circular, a copy of which appears in the Appendices, page 46, the nature and scope of Part II. of the Act were explained. It was also intimated that the Department would not administer the measure in any harsh spirit, and would welcome the active co-operation of all vendors of seeds in their efforts to place and maintain the seed trade of this country on a high level in every respect.

Shortly after the Act came into force the Department proceeded to appoint officers for the purposes of taking samples, etc. The officers who discharge similar duties under the Fertilisers and Feeding Stuffs Act were nominated to carry out these duties, and began to take samples early in the spring of 1910. In all, over 800 samples were taken and submitted to the Department for examination, and of these about 500 were tested.

The reports of the Department's Seed Testing Station showed that a large proportion of these samples were of very inferior quality, many being quite worthless for sowing purposes. In view of the fact that the Act was only in its first year of operation the Department did not deem it advisable to have recourse to the powers conferred upon them by the Statute of publishing the results of these tests, together with the names of the vendors on whose premises the samples were taken, and of the wholesale firms from whom they had obtained the seed. Letters were, however, addressed in all these cases to the retail and wholesale vendors pointing out the unsatisfactory nature of the seeds, and impressing upon them the desirability of stocking better seeds in future. The retail seedsmen were also advised to ask for statements of percentages of purity and germination in respect of the seeds they were purchasing.

A further circular-letter was addressed in January, 1911, to all vendors of agricultural seeds in Ireland informing them of the unsatisfactory nature of much of the seed sold for agricultural purposes in the country, and again urging them to exercise greater care in the selection of their stocks of seeds. A copy of this letter will be found in the Appendices (page 47).

Following this action a number of attacks was made upon the Department, both in letters addressed to them by retailers and wholesale firms in Ireland and Great Britain, and in articles which appeared in the trade and agricultural Press. Accusations were made of carelessness in the taking of samples, and of inaccuracy in the testing of them at the Department's Seed Testing Station.

These charges were based principally upon the fact that samples of the same seeds had shown, when tested at certain

Continental or other Stations, higher percentages of germination than when tested at the Department's Station.

A lengthy correspondence ensued between the Department and several wholesale firms, and finally, on the suggestion of the former, a deputation from the United Kingdom Seed Merchants' Association waited upon the Department on 23rd March, 1911, and the whole question was thoroughly discussed.

On behalf of the Department the deputation was assured that every precaution, consistent with a proper and effective administration of the Act, would be taken to avoid the infliction of any hardship on the legitimate trader. It was, at the same time, pointed out that, whilst there are many firms who send or import seed of good quality into this country, there are others who are engaged in the sale of seeds of the most inferior description. The Act had been passed to put a stop to this class of trade, and the Department had a responsibility placed upon them by Statute which they were bound to discharge.

With regard to the differences between the results of tests made at the Department's Station and at well-known Continental Stations it was pointed out that these occurred almost exclusively in the cases of grass and clover seeds, and were due to the fact that the principles upon which the methods of testing were based are dissimilar.

In each case before a sample is subjected to the test for germination it undergoes a purity test, and it is in the carrying out of the latter test that differences exist between the Department's method and that adopted at other stations. At the Department's Station all the seeds in a sample which are, or purport to be, of the kind of which the sample is stated to consist are regarded as pure seed, and the percentage weight of such seeds present in the sample constitutes the percentage of purity of that sample.

The impurities (which are removed from the sample with scrupulous care during the carrying out of the purity test) consist of foreign matter such as sand, dirt, and other debris, as well as of the seeds of plants, whether weeds or otherwise, other than those of the particular kind specified in the designation of the sample.

At most Continental and other stations not only are the real impurities, as defined above, treated as such, but so are also all those seeds in the sample which do not possess, or appear not to possess, a kernel, or "caryopsis" as it is technically termed, in spite of the fact that these seeds are of the kind named in the description of the sample.

In short, the Department test for germination the seed practically as it is sold to the farmer, the real impurities only having been removed, while at the Continental and other stations carefully selected seeds are tested. Hence the percentage of germination obtained by the "Continental" method always tends to be higher than that obtained for the same sample by the method employed at the Department's Seed Testing Station, whereas the percentage of purity obtained by the Department's method is higher than that obtained by the "Continental" method, a point which is as a rule lost sight of. These differences are in the case of seeds of the highest quality practically negligible, and are most marked in the case of light and inferior seeds.

The Department informed the Deputation that they had no hesitation in claiming that the method followed at their Station is the most satisfactory from every standpoint, and that they were not prepared to modify it, or to conform to any other method, no matter how widely employed, or however satisfactory the latter might be from the seed merchant's point of view. It was also intimated that British seedsmen could have samples of the seeds they proposed to sell in Ireland tested at the Department's Station at the usual charges for seedsmen, and that they could then sell them on guarantees based on the results of these tests.

Several members of the deputation visited the Department's Seed Testing Station, and expressed themselves as satisfied with the careful and accurate manner in which the work of testing samples was performed.

A deputation consisting of members of the Irish Seed and Nursery Trades' Association also waited upon the Department, and urged upon them the desirability of a uniform system of testing being adopted throughout the United Kingdom, and of standards of purity and germinating capacity being fixed by the Department.

The Department thoroughly concurred in the view that a uniform system of testing for the United Kingdom was desirable, and expressed their willingness to do anything in their power to effect the adoption of such a system. With regard to the fixing of standards, it was pointed out that this was hardly feasible owing to the variations from year to year in the quality of seeds, even when of the best description. A more serious objection to standardisation, however, would be the tendency on the part of seedsmen to work down to the minimum standards fixed, and thus depreciate the quality of the seed available.

In view of the large amount of misapprehension that appeared to exist on the subject the Department issued a memorandum (Appendices, page 48) setting forth in detail the causes of the differences between the results of tests of samples tested at their Seed Testing Station, and those tested at various Stations in England and on the Continent. This memorandum was widely circulated and will, it is hoped, help to make clear the position of the Department in the matter of seed-testing.

During the spring of 1911 the official samplers of the Department were again engaged in the work of visiting the shops and stores of vendors of agricultural seeds. Upwards of 1,700 samples were taken and examined, and of these almost 700 were tested at the Department's Seed Testing Station.

A Table will be found in the Appendices (page 53) showing the number of samples tested in each of the two years during which the Act has been in operation, arranged according to the counties from which the samples were obtained. The number of unsatisfactory samples in each case is also given, and it will be seen that in 1910 over sixty-five per cent. and in 1911 over fifty-five per cent. of the samples tested were found to be unsatisfactory. It will also be observed that these unsatisfactory samples were not confined to any particular districts, but were found distributed far and wide over the whole country.

It would not, however, be fair to use the numbers given above in forming an accurate estimate of the quality of the agricultural seeds in general use throughout Ireland, for in taking samples more attention was probably paid to cases where the presence of unsatisfactory seed was suspected. Many farmers, of course, deal direct with the larger firms who specialise in agricultural seeds, and take the precaution of having samples tested at the Department's Seed Testing Station; and, judging from the results of such tests, they obtain in most cases seeds of a satisfactory nature, and in many instances of the highest quality. It is worthy of note that in those parts of Ireland where the farmers make least use of the Seed Testing Station, the low quality of the seeds offered for sale locally is usually the most marked.

A further Table in the Appendices (page 54) shows the number of samples of each of the various kinds of seeds tested under the Act during the years 1910 and 1911, together with the number of unsatisfactory samples of each kind and the average percentages of purity and germination of the unsatisfactory samples.

Much of the unsatisfactory seed consists of low bushel weights of the rye grasses, and of cleanings from the better classes of seed known as "Hay Seed" of various kinds. One large wholesale firm in Belfast, indeed, being apparently ashamed of regarding their goods in this line as grass seed, offered it last season to their retail customers as "blowings." In addition to the extremely poor germinating capacity of this class of stuff, the purity is also very low, and amongst the impurities are to be found, as a rule, large numbers of weed seeds, so that money expended in the purchase of such material is practically as good as thrown away.

The two worst samples examined were of Meadow Fescue Seed. In the first one, which was on sale in Dungannon, Co. Tyrone, in 1910, and had been supplied by a well-known Belfast firm, the purity was 99% but the germination was *nil*. In the second case a sample taken in Navan, and supplied by a well-known Scotch firm, showed a purity of only 62·8%, a germination of 1% and was offered for sale at 1*s*. per lb. !

These are extreme cases, but unhappily there are others which are but little better, and of the total number of samples tested during the two years over eleven per cent. showed a germination of 25% and under, while more than twenty-three per cent. only showed a germination between that and 50%.

The samples tested represent the output of some forty-five wholesale firms, but the bulk of the trade is carried on by about twenty of these, chiefly located in Ireland and Scotland. With regard to some firms no unsatisfactory samples were met with, but there are some ten or a dozen firms, the half or more of whose samples have been found to be unsatisfactory in both seasons. In the case of a firm in Sligo three-quarters, and of one in Dublin two-thirds, of the samples tested during the two years were found to be unsatisfactory. In another case, out of forty-two samples taken from seed supplied by a wholesale firm in Co. Down, forty were found to be unsatisfactory. In this last instance, seeing that, in spite of several warnings, the sale of these unsatisfactory seeds was persisted in, the results of the tests of a number of samples, together with the name of the vendor in Co. Kerry, and the wholesale supplier, were displayed on posters in their respective districts.

On the whole, a slight improvement was manifest in the quality of the seeds tested in 1911, as compared with those examined in the preceding year. A large proportion of the samples are, however, still very unsatisfactory, and the Department have at present under consideration the question of the action they will have to take in regard to these cases.

VII.—SALES FOR AGRICULTURAL PURPOSES BILL.

A Bill under the above title was introduced into the House of Lords last session. The measure, as drafted, proposes to repeal the Fertilisers and Feeding Stuffs Act, in order to amend various provisions in that Act. The chief alterations are that, under the Bill, statements in an invoice or descriptive advertisement, etc., are to be an absolute warranty as to the facts stated, but limits of error in relation to percentages are preserved in the case of prosecutions. Further particulars are required to be given in certain invoices, and the obligation to give an invoice, which at present applies only to articles sold for use as fertilisers of the soil and food for cattle or poultry, is extended by the Bill to dips for cattle, steeps for seeds, washes for plants, weed dressings and killers, and insecticides. In respect of such articles it is provided that samples shall be submitted to the Board of Agriculture (in Ireland to the Department) for approval, and that on a sale the invoice shall state that the article sold is not below the quality or standard of a sample of the article submitted to and approved by the Board of Agriculture.

It is also proposed that the veto of the Board of Agriculture upon prosecutions under the Act should be discontinued, and that the periods within which samples shall be taken and prosecutions instituted should be extended to twenty-eight days and four months, respectively. Further, all regulations made by the Board are to be submitted in draft to Parliament, and may be disallowed if either House decides against the draft or any part of it.

Evidence in regard to the probable effect of the application to Ireland of the measure as drafted was given by an Inspector of the Department before the Select Committee of the House of Lords appointed to enquire into the Bill.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
AGRICULTURAL BRANCH,
May, 1912.

APPENDICES.

FERTILISERS AND FEEDING STUFFS ACT, 1906.

RETURN showing the names and addresses of the Agricultural Analysts under the above Act in each County and County Borough in Ireland, and giving particulars of arrangements existing in some Counties whereby farmers and other residents in the County can have samples of manures and feeding stuffs analysed at a reduced fee.

County.	Name and Address of Analyst.	Special rates which have been notified to the Department at which samples of manures and feeding stuffs are tested for residents in each county.
Antrim,	Robert F. Blake, F.I.C., F.C.S., Scottish Provident Buildings, Donegall Sq., West, Belfast.	Nil.
Armagh,	J. Harold Totton, B.Sc., F.I.C., 76 Scottish Temperance Buildings, Donegall Square, South, Belfast.	Fertilisers and feeding stuffs at 2/6 per sample.
Carlow,	Sir Charles A. Cameron, Castle Street, Dublin.	Fertilisers and feeding stuffs at 3/6 per sample.
Cavan,	Do., do., do.	Guano and superphosphate, 5/–; potash, 5/–; feeding stuffs, 5/– per sample.
Clare,	Do., do., do.	Nil.
Cork,	D. J. O'Mahony, F.C.S., City Hall, Cork.	,,
Donegal,	Charles McMullan, F.I.C., 4 William Street Chambers, Belfast.	Fertilisers and feeding stuffs, 5/– per sample.
Down,	Sir Charles A. Cameron, Castle Street, Dublin.	Fertilisers, 2/6 per sample (2/6 extra for determination of potash); feeding stuffs, 2/6 per sample.
Dublin,	Do., do., do.	Nil.
Fermanagh,	Do., do., do.	Fertilisers and feeding stuffs, tested free.
Galway,	Do., do., do.	Nil.
Kerry,	D. J. O'Mahony, F.C.S., City Hall, Cork.	Fertilisers and feeding stuffs, 2/6 per sample.
Kildare,	Sir Charles A. Cameron, Castle Street, Dublin.	Do., do., do.
Kilkenny,	Do., do., do.	Nil.
King's,	D. J. O'Mahony, F.C.S., City Hall, Cork.	Fertilisers and feeding stuffs, 2/6 per sample.
Leitrim,	Sir Charles A. Cameron, Castle Street, Dublin.	Nil.
Limerick,	Do., do., do.	Fertilisers, 5/– (5/– extra for determination of potash); feeding stuffs, 5/– per sample.
Londonderry,	J. Harold Totton, B.Sc., F.I.C., 76 Scottish Temperance Buildings, Donegall Square, South, Belfast.	Fertilisers and feeding stuffs, 5/– per sample.

RETURN showing the names and addresses of the Agricultural Analysts under the above Act in each County and County Borough in Ireland, and giving particulars of arrangements existing in some Counties whereby farmers and other residents in the County can have samples of manures and feeding stuffs analysed at a reduced fee.—*continued.*

County.	Name and Address of Analyst.	Special rates which have been notified to the Department at which samples of manures and feeding stuffs are tested for residents in each county.
Longford,	Charles McMullan, F.I.C., 4 William Street Chambers, Belfast.	Superphosphates, 5/-; compound manures, 10/-; feeding stuffs, 7/6 per sample.
Louth,	Sir Charles A. Cameron, Castle Street, Dublin.	Fertilisers and feeding stuffs, 3/6 per sample.
Mayo,	Do., do., do.	Nil.
Meath,	Do., do., do.	Fertilisers and feeding stuffs, 2/6 per sample.
Monaghan,	Do., do., do.	Nil.
Queen's,	Do., do., do.	„
Roscommon,	Do., do., do.	Fertilisers and feeding stuffs, 2/6 per sample.
Sligo,	Do., do., do.	Samples of fertilisers and feeding stuffs analysed free.
Tipperary (N.),	Do., do., do.	Fertilisers and feeding stuffs. 3/6 per sample.
Tipperary (S.),	Do., do., do.	Fertilisers and feeding stuffs, 12/6 per sample.
Tyrone,	Robert F. Blake, F.I.C., F.C.S., Scottish Provident Buildings, Donegall Square, W., Belfast.	Nil.
Waterford,	Sir Charles A. Cameron, Castle Street, Dublin.	Fertilisers and feeding stuffs, 2/6 per sample.
Westmeath,	Do., do., do.	Do., do., do.
Wexford,	Do., do., do.	Do., do., do.
Wicklow,	Do., do., do.	Do., do., do.
Co. Borough :		
Belfast,	J. Harold Totton, B.Sc., F.I.C., 76 Scottish Temperance Buildings, Donegall Square, South, Belfast.	Nil.
Cork,	D. J. O'Mahony, F.C.S., City Hall, Cork.	„
Dublin,	Sir Charles A. Cameron, Castle Street, Dublin.	„
Limerick,	Do., do., do.	„
Londonderry,	Professor Leebody, Magee College, Londonderry.	„
Waterford,	Sir Charles A. Cameron, Castle Street, Dublin.	Fertilisers and feeding stuffs, 2/6 per sample.

Particulars of the names, addresses and occupations of the persons appointed by the Department to act as Official Samplers under the Fertilisers and Feeding Stuffs Act, 1906.

C. J. McCarthy, 4 Upper Merrion Street, Dublin, Agricultural Inspector.
J. Johnston, do., do., do.
J. W. Steen, do., do., do.
J. L. Duncan, do., do., do.
P. McGovern, do., do., Junior Agricultural Inspector.
J. M. Adams, Agricultural Station, Clonakilty, Superintendent Agricultural Station.
W. J. Megaw, Agricultural Station, Athenry, Superintendent Agricultural Station.
J. Getty, 4 Upper Merrion Street, Dublin, Technical Assistant.
H. Kennedy, Munster Institute, Cork, Farm Manager.
P. Taylor, Stranorlar, Co. Donegal, Agricultural Overseer.
R. Y. Smith, O'Brien's Hotel, Galway, do.
D. S. Simpson, Prospect Avenue, Westport, do.
G. Doolan, 4 Upper Merrion Street, Dublin, Horticultural Overseer.

J. Marchbank, Carnheath, Carrickfergus,	Agricultural Instructor,	Co. Antrim.
P. T. O'Hare, 6 Lawnview Place, Ballymena,	do.,	do.
J. Bradshaw, The Cottage, Deansbridge, Armagh,	do.,	Co. Armagh.
J. Kelly, Pembroke Road, Carlow,	do.,	Co. Carlow.
J. Hanly, Erskine House, Cavan,	do.,	Co. Cavan.
D. Lucey, Courthouse, Ennis,	do.,	Co. Clare.
J. Mahony " "	do.,	do.
W. F. Prendergast, 4 Laurelwood, Douglas Rd., Cork,	do.,	Co. Cork.
A. O'Sullivan, 26 O'Brien Street, Mallow,	do.,	do.
W. A. Pinkerton, 22 George Street, Clonakilty,	do.,	do.
C. C. Maguire, Courthouse, Cork,	do.,	do.
T. Ward, Courthouse, Lifford,	do.,	Co. Donegal.
W. D. Davidson, 1 Collingwood Avenue, Belfast	do.,	Co. Down.
J. W. McKay, 31 Ormond Road, Rathmines,	do.,	Co. Dublin.
W. O. Smyth, 6 Willoughby Place, Enniskillen	do.,	Co. Fermanagh.
T. Cotter, Ivymount, Athenry,	do.,	Co. Galway.
N. Dromey, Courthouse, Galway,	do.,	do.
J. Scully, Main Street, Listowel,	do.,	Co. Kerry.
T. Wade, Glenville, Naas,	do.,	Co. Kildare.
J. Lucey, 29 Patrick Street, Kilkenny,	do.,	Co. Kilkenny
J. Crowley, Courthouse, do.,	do.,	do.
D. T. Ritchie, Central Hotel, Tullamore,	do.,	King's Co.
J. J. O'Sullivan, High Street, Drumshambo,	do.,	Co. Leitrim.
T. Wibberley, Ballintemple Ho., Newcastle West,	do.,	Co. Limerick
M. Gleeson, Cusson's Hotel, Kilmallock,	do.,	do.
D. R. Aiken, 6 Union Street, Coleraine,	do.,	Co. Londonderry.
W. L. Phair, Arms Hotel, Longford,	do.,	Co. Longford
T. J. Gallagher, Courthouse, Dundalk,	do.,	Co. Louth.
J. O'Callaghan, The Green, Castlebar,	do.,	Co. Mayo.
J. Duffy, Courthouse, Castlebar,	do.,	do.
N. Leitch, " Navan,	do.,	Co. Meath.
A. Carruth, " Monaghan,	do.,	Co. Monaghan
D. Collins, 9 Market Square, Maryborough,	do.,	Queen's Co.
C. J. M'Carthy, Church Street, Roscommon,	do.,	Co. Roscommon.
R. W. Parker, William Street, Sligo,	do.,	Co. Sligo.
M. H. M'Donagh, Courthouse, Nenagh,	do.,	Co. Tipperary (N.R.)
G. O'Donovan, 7 Sarsfield Street, Clonmel,	do.,	Co. Tipperary (S.R.)
E. S. Daly, Abbeyville, Omagh,	do.,	Co. Tyrone.
P. O'Keeffe, The Square, Dungarvan,	do.,	Co. Waterf'd
M. Horgan, 16 Greville Street, Mullingar,	do.,	Co. Westmeath.
J. J. Brennan, Courthouse, Wexford,	do.,	Co. Wexford.
A. Nolan, Bay View Road, Wicklow,	do.,	Co. Wicklow.

RETURN showing the Number of Samples of Fertilisers, Feeding Stuffs and Seeds taken by the Agricultural Instructor for each County as Official Sampler during the year ended 30th September, 1911.

County.	Number of Samples Taken.		
	Fertilisers.	Feeding Stuffs.	Seeds.
Antrim,	2	10	11
Armagh,	5	3	27
Carlow,	5	1	18
Cavan,	25	17	28
Clare,	11	6	22
Cork,	14	13	120
Donegal,	8	—	43
Down,	11	2	36
Dublin,	6	10	27
Fermanagh,	5	1	34
Galway,	9	3	24
Kerry,	13	4	21
Kildare,	2	2	23
Kilkenny,	9	34	143
King's,	6	8	65
Leitrim,	3	—	7
Limerick,	9	9	28
Londonderry,	8	11	26
Longford,	3	1	18
Louth,	11	8	61
Mayo,	6	3	34
Meath,	2	2	25
Monaghan,	3	6	43
Queen's,	8	16	60
Roscommon,	38	18	34
Sligo,	2	—	45
Tipperary (N.R.),	8	9	29
,, (S.R.),	15	11	29
Tyrone,	7	1	15
Waterford,	12	9	118
Westmeath,	1	3	15
Wexford,	18	10	35
Wicklow,	13	4	54
Totals,	298	235	1,327

A. B. Memo. No. 4.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

AGRICULTURAL BRANCH.

VALUATION OF ARTIFICIAL MANURES, 1911.

The following Unit Prices have been fixed by the Department for use in comparing the approximate commercial values of manures this season :—

Nitrogen	15/–	per Unit.
Phosphates, soluble in water	1/10	„
*Phosphates, soluble in Citric Acid	1/4	„
†Bone Phosphate	1/8	„
Potash	4/8	„

* The Unit Value of Citric Soluble Phosphate in Basic Slag at 1*s*. 9*d*.

† No allowance should be made for Insoluble Phosphates unless from Bone.

These Units are based on the present retail cash prices of manures in Dublin and Belfast. When these units are multiplied by the respective percentages, if any, in the analysis of a manure, and 10/– is added for mixing, the result will represent very nearly the *cash price* of one ton of the manure free on rail at Dublin or Belfast. To ascertain the corresponding price at any other place in Ireland, add the amount shown in the list.

No one need pay more than these prices, and, in some instances, manures can be bought at something less; especially is this the case where farmers combine to bulk their orders, or where they buy the ingredients and mix for themselves.

Statement showing the amount which must be added to the Price of Manures in Dublin or Belfast to represent the cost of the same Manures at the following places when purchased from a local merchant or in quantity direct from the manufacturers :—

	Per Ton.
A.	
Abbeydorney ..	8/9
Abbeyfeale	11/–
Abbeyleix	7/9
Achill	10/9
Adare	9/–
Adoon	9/–
Aghada	3/9
Aghadowey ..	5/3
Aghalee	3/9
Aldergrove	4/3
Annaghmore ..	5/–
Antrim	8/9
Ardagh	9/9
Ardara Road ..	10/9
Ardee	4/6
Ardfort	8/3
Ardglass	5/–
Ardrahan	10/9
Ardsollus	10/3
Arigna	10/9
Arklow	5/–
Armagh	5/3
Armoy	6/6
Arva Road	8/6
Askeaton	9/–
Athboy	5/6
Athenry	8/9
Athlone	7/–
Athy	5/6
Attanagh	7/9
Attymon	9/9
Augher	8/–
Aughnacloy ..	7/6
Aughrim (Wicklow)	4/9
Aunascaul	10/8
Aylwardstown ..	3/3
B.	
Bagnalstown ..	7/9
Balbriggan	4/–
Balla	9/9
Ballaghadereen ..	10/3
Ballina	8/3
Ballynahinch (Co. Galway). ..	12/–
Ballinamallard ..	8/6
Ballinamore ..	10/–
Ballinamore (Donegal). ..	8/6
Ballinascarthy ..	8/–
Ballinasloe	8/–
Ballinase	7/6
Ballincollig	3/–
Ballinderry	3/3
Ballindine	10/9
Ballindrait	4/9
Ballineen	8/–
Ballinglen	5/6
Ballingrane ..	9/3
Ballinhassig ..	3/3
Ballinlough ..	10/3
Ballinrobe	10/9
Ballintogher ..	9/–
Ballintra	8/9
Ballybay	5/9
Ballybeg	5/3
Ballybofey (Stranorlar).	7/6
Ballyboley	5/9
Ballybrophy ..	6/3
Ballybunion ..	11/3
Ballycar	9/9
Ballycarry	3/9
Ballycastle (Antrim)	6/3
Ballyclare	2/6
Ballyclare Junc. ..	3/–
Ballyconnell ..	9/6
Ballycullane ..	4/6
Ballycumber ..	7/3
Ballydehob ..	8/6
Ballyduff (Cork) ..	6/6
Ballygawley ..	7/9
Ballyglunin ..	10/–
Ballygowan ..	2/3
Ballyhack	3/9
Ballyhaise	8/–

	Per Ton.
Ballyhale	4/9
Ballyheunis	10/3
Ballyhooley	6/3
Ballyliffin	5/9
Ballymegan	4/6
Ballymagorry	4/-
Ballymartle	4/-
Ballymena	6/-
Ballymoe	9/9
Ballymoney	4/3
Ballymote	9/-
Ballynahinch (Co. Down).	4/-
Ballynahinch Junc. (Co. Down).	3/3
Ballynashee	7/3
Ballynoe	5/3
Ballynure	6/9
Ballyragget	7/6
Ballyroney	5/3
Ballyshannon	8/9
Ballysodare	7/6
Ballyvary	9/3
Ballyward	5/3
Ballywillan	7/9
Ballywilliam	5/6
Baltimore	8/9
Baltinglass	6/-
Banagher	7/9
Banbridge	4/3
Bandon	5/-
Bangor (Down)	2/6
Bansha	8/-
Banteer	6/6
Bantry	7/6
Barnagh	10/6
Batterstown	3/3
Bawnboy	10/9
Beauparc	4/-
Bective	4/9
Belcoo	12/-
Bellarena	5/-
Belleek	10/-
Bellurgan	4/-
Belmont	6/6
Belmullet	10/-
Belturbet	8/3
Bennetts Bridge	5/9
Beragh	7/3
Bessbrook	4/9
Birdhill	9/6
Blackrock (Cork)	3/3
Blackwatertown	5/6
Blarney	2/9
Blessington	3/3
Boher	8/9
Borris	7/-
Boyle	9/6
Bray	2/3
Bridge End	3/3
Bridgetown (Donegal)	8/9
Bridgetown (Wexford)	5/3
Brittas	2/9
Brookeboro'	9/-
Brookmount	2/9
Bruckless	10/6
Bruree	7/3
Bunheg	7/6
Buncrana	4/3
Bundoran	16/-
Bundoran Junc.	8/3
Burnfoot	3/3
Burton Port	6/6
Bush	4/-
Buttevent	6/-
C.	
Cahir	7/-
Cahirciveen	10/-
Caledon and Tynan	6/3
Camolin	5/-
Campile	3/3
Capecastle	7/-
Cappagh	6/9
Cappoquin	7/3
Caragh Lake	11/-
Carberry	5/3
Cargan	9/3
Carlingford	5/-
Carlow	7/-
Carndonagh	6/-
Carrickfergus	2/3
Carrichue	3/9
Carrickmacross	4/6
Carrickmore	7/3
Carrick-on-Shannon	8/6
Carrick-on-Suir	4/6
Carrigaline	3/9
Carrigaloe	4/-
Carrigans	4/-
Carrigrohane	2/9
Carrigtwohill	3/9
Carrolls Cross	4/3
Carrowen	4/-
Carrowmore	9/6
Cashel	9/6
Cashelnagore	6/6
Castlebar	8/6
Castlebellingham	3/6
Castleblayney	5/-
Castlecaldwell	9/9
Castleconnell	9/-
Castledawson	6/3
Castlederg	7/-
Castlefinn	5/-
Castlegregory	9/9
Castlegregory Junc.	9/-
Castlegrove	11/-
Castleisland	9/3
Castlemaine	10/-
Castlerea	9/9
Castlerock	4/9
Castletown	6/9
Castletownberehaven	8/9
Castletownroche	6/-
Castlewellan	5/3
Cavan	8/6
Celbridge	2/9
Chapel	4/6
Charlemont	5/3
Charlestown	11/-
Charleville	6/9
Church Cross	9/9
Church Hill	5/9
Clady	4/9
Clara	7/3
Clare Castle	8/9
Claremorris	10/9
Clashganny	6/-
Clifden	11/3
Cloghan	7/6
Clogher	8/3
Cloghroe	3/3
Clonakilty	6/3
Clonakilty Junc.	5/6
Clondulane	6/-
Clones	7/-
Clonmany	5/-
Clonmel	4/9
Clonsilla	1/9
Cloughjordan	8/-
Coachford	4/-
Coachford Junc.	3/-
Coagh (Via Moneymore).	7/3
Coalisland	6/6
Colbinstown	5/6
Colebrook	10/9
Coleraine	2/6
Collooney	7/-
Comber	2/-
Convoy	5/6
Cookstown	7/3
Cookstown Junc.	4/9
Cootehill	6/6
Corbally	3/9
Corbet	4/9
Cork	1/3
Corofin	10/6
Courtmacsherry	5/-
Courtwood	5/3
Craigavad	2/-
Cratloe	9/6
Craughwell	10/-
Creeslough	6/6
Crew	7/6
Creighanroe	5/6
Crolly	6/6
Crookstown Road	4/6
Croom	8/-
Crossdoney	8/3
Crossgar	4/-
Crosshaven	4/3
Crossroads	8/9
Crumlin	4/-
Crusheen	11/3
Cullion	3/-
Cullovilie	4/3
Cullybackey	5/9
Culmore	1/3
Currahinny	4/3
Curry	10/6
D.	
Dalkey	3/-
Delgany	3/3
Derryork	5/9
Dervock	5/9
Desert	5/9
Desertmartin	6/9
Devon Road	11/-
Dingle	8/9
Doagh	2/6
Donabate	8/-
Donaghadee	2/9
Donaghmore	6/3
Donamon	9/6
Donegal	8/9
Donemana	3/-
Donoughmore	4/-

	Per Ton.
Doonbeg	12/9
Dooniskey	4/9
Dooran Road	9/9
Downhill	5/-
Downpatrick	4/3
Draperstown	7/3
Drimoleague	7/6
Dripsey	3/9
Drogheda	1/3
Dromahair	9/-
Dromineer	7/3
Dromkeen	9/3
Dromod	7/-
Dromore (Down)	3/9
Dromore Road	7/0
Drumfries	5/-
Drumree	3/6
Drumshambo	10/9
Drumsna	9/-
Drumsurn	5/3
Duleek	3/9
Dunadry	3/9
Dunboyne	2/6
Duncannon	3/9
Duncormick	5/6
Dundalk or Dundalk Junc.	1/3
Dundrum (Down)	5/-
Dundrum (Dublin)	2/-
Dundrum (Tipp.)	9/-
Dunfanaghy	7/6
Dunfanaghy Road	6/6
Dungannon	5/9
Dungarvan	5/-
Dungiven	5/9
Dungloe Road	6/6
Dunkineely	10/3
Dunlavin	5/3
Dunleer	4/-
Dunloy	6/3
Dunmanway	6/9
Dunsandle	9/9
Durrow	5/6
Durrus Road	8/3

E.

Edenderry	4/-
Edermine Ferry	5/6
Edgeworthstown	7/6
Eglinton	3/-
Embankment	1/6
Emly	8/3
Emyvale Road	7/-
Enfield	4/6
Ennis	8/9
Enniscorthy	2/6
Enniskillen	8/9
Ennistymon	12/6

F.

Fahan	3/9
Falcarragh	6/6
Farranaleen	6/6
Farranfore	9/-
Farrangalway	4/6
Fenit	7/6
Ferbane	6/9
Fermoy	5/9

	Per Ton
Ferns	3/9
Fethard	6/6
Fiddown	4/-
Fintona	7/-
Fintown	8/-
Firmount	4/-
Fivemiletown	8/6
Float	7/6
Florencecourt	11/9
Foxford	8/-
Foxhall	6/3
Fox's Bridge	3/9
Foynes	10/-

G.

Galway	6/3
Garvagh	5/3
Geashill	7/-
Gibbstown	5/3
Glanworth	6/-
Glarryford	6/3
Glasslough	6/6
Glenavy	3/9
Glenbeigh	11/3
Glenealy	3/3
Glenfarne	11/6
Glengariffe	8/6
Glenmaquin	5/6
Glenmore	7/3
Glenties	8/6
Glin	11/3
Glynn	4/6
Goold's Cross	9/-
Goraghwood	4/6
Goresbridge	7/6
Gorey	4/9
Gormanstown	4/-
Gort	11/3
Gortatlea	8/9
Gowran	7/-
Graigue	5/6
Grange	3/0
Grange Con	5/9
Greencastle	1/9
Greenisland	2/6
Greenore	4/3
Greystones	3/3
Groomsport	3/-
Gweedore	6/6

H.

Hamilton's Bawn	6/-
Harristown	4/6
Haulbowline	4/-
Hazelhatch	2/9
Headford Junc.	8/6
Headwood	7/3
Healy's Bridge	2/9
Helen's Bay	2/6
Hilden Siding	1/9
Hill of Down	5/6
Hillsborough	3/-
Hollyhill	10/-
Hollymount	11/-
Hollywood	1/6
Horse and Jockey	7/3
Horseleap	7/3
Howth	2/9

I.

	Per Ton.
Inch	5/3
Inch Road	3/3
Inniskeen	3/3
Inver	9/9
Irvinestown	8/6

J.

Jordanstown	2/3

K.

Kanturk	6/9
Katesbridge	5/-
Keady	6/-
Kells (Ballymena)	8/6
,, (Meath)	5/9
,, (Kerry)	13/-
Kellswater	5/-
Kenmare	7/3
Kesh	9/-
Kilbeggan	7/6
Kilcock	3/6
Kilcoe	10/3
Kilcool	3/3
Kilcrea	3/9
Kildare	5/-
Kildysart	10/6
Kilgarvan (Kerry)	9/6
Kilgarvan (Tipp.)	7/9
Kilkee	12/6
Kilkenny	6/3
Killagan	6/3
Killala	7/9
Killaloe	8/9
Killarney	9/-
Killeagh	5/3
Killeshandra	8/9
Killinick	4/9
Killorglin	10/-
Killough	5/-
Killucan	6/-
Killumney	3/3
Killurin	4/6
Killybegs	8/9
Killygordon	5/-
Killylea	5/9
Kilmacow	3/3
Kilmacrennan	6/9
Kilmacthomas	4/6
Kilmainham Wood	6/3
Kilmallock	7/6
Kilmeaden	3/9
Kilmessan	4/3
Kilmorna	10/9
Kilmurry (Cork)	3/9
,, (Clare)	13/3
Kilrane	3/9
Kilrea	5/9
Kilroot	3/-
Kilrush	10/-
Kilsheelan	5/6
Kiltimagh	11/6
Kingscourt	6/6
Kinsale	5/-
Kinsala Junc.	4/-
Knockanally	6/9
Knockcroghery	9/-
Knocklong	8/-

	Per Ton.
Knockloughrim	6/9
Kylemore	8/-
L.	
Laffan's Bridge	7/-
Laghey	8/9
Lanesborough	8/-
Larne	4/3
Larne Harbour	4/6
Laurencetown	4/6
Laytown	3/9
Leighlinbridge	7/9
Leitrim	5/3
Leixlip	2/6
Letterkenny	5/6
Levittstown	6/-
Leyny	0/3
Limavady	4/6
,, Junc.	4/3
Limerick	6/3
,, Junc.	7/6
Lisbellaw	8/6
Lisburn	1/9
Liscooley	5/6
Lisduff	8/9
Liselton	13/3
Lismore	7/3
Lisnagry	9/-
Lisnaskea	8/-
Lispole	10/9
Listowel	10/3
Lixnaw	9/6
Lombardstown	6/-
Londonderry	1/3
Longford	8/-
Loo Bridge	9/-
Loughgilly	5/3
Loughmeala	10/-
Loughrea	10/-
Lowtown	4/3
Lucan	2/6
Lurgan	3/9
Lusk	3/3
Luska	7/3
M.	
Maam Cross	10/9
Macfin Junc.	4/6
Macmine Junc.	5/3
Macroom	5/3
Madore	8/3
Mageney	8/6
Maghera	7/3
Magherafelt	6/8
Magheramorne	4/3
Magilligan	6/3
Maguiresbridge	8/6
Malahide	2/-
Malin Head	3/9
Mallaranny	9/9
Mallow	6/6
Manorcunningham	6/-
Manorhamilton	10/9
Markethill	6/6
Maryboro'	6/3
Maynooth	3/-
Middleton	3/3
Middletown (Armagh)	6/9
Milford (Carlow)	7/3
,, (Donegal)	7/6
Millstreet	7/3
Milltown (Tuam)	10/6
Milltown-Malbay	13/6
Mitchelstown	6/9
Moate	7/6
Mogeely	4/6
Mohill	9/-
Moira	3/6
Molahiffe	9/6
Monaghan	8/3
Monaghan Road	6/3
Monasterevan	4/9
Moneymore	7/-
Monkstown (Cork)	3/9
Moorfields	8/-
Morley's Bridge	9/3
Mountain Stage	12/8
Mountcharles	8/9
Mountmellick	6/3
Mountrath	7/9
Mountshannon	9/9
Mourne Abbey	4/9
Moville	3/9
Moy	5/3
Moyasta	12/3
Moycullen	7/9
Muckamore	4/3
Mullafarnaghan	4/-
Mullinavat	3/9
Mullingar	8/3
Mulroy	7/6
Multyfarnham	6/9
N.	
Naas	3/6
Navan	3/9
Nenagh	7/3
Newbliss	6/9
Newbridge	4/3
Newbuildings	3/3
Newcastle (Down)	5/-
Newcastle West	10/-
Newcastle (Wicklow)	3/6
Newmarket (Cork)	7/3
Newport (Mayo)	7/9
Newport Trench	4/3
New Ross	2/6
Newry	2/6
Newtownards	2/-
Newtownbutler	7/6
Newtowncunningham	4/-
Newtownforbes	8/3
Newtownstewart	5/9
Nobber	6/-
O.	
O'Brien's Bridge	9/9
Oldcastle	7/-
Omagh	6/6
Omeath	6/3
Oola	9/-
Oranmore	7/8
Oughterard	9/3
Ovoca	4/3
P.	
Palace East	4/6
Pallas	9/3
Parkmore	8/-
Parsonstown	7/3
Passage West	3/9
Patrick's Well	8/9
Peake	4/-
Pettigo	9/3
Philipstown	5/9
Pluck	5/6
Pomeroy	6/9
Portadown	3/9
Portarlington	5/-
Porthall	4/-
Portrush	2/6
Portsalon	7/6
Portstewart	4/3
Portumna	8/3
Poulaphouca	4/-
Poyntzpass	5/3
Q.	
Queenstown	4/3
Queenstown Junc.	3/6
Quilty	13/6
Quin	10/3
R.	
Raffeen	3/9
Rahan	6/3
Ramelton	6/-
Randalstown	4/9
Raphoe	5/3
Rathangan	5/3
Rathdrum	3/-
Rathduff	4/-
Rathfriland	8/9
Rathkeale	9/6
Rathmore	8/-
Rathmullen	6/-
Rathnew	3/3
Rathvilly	5/3
Recess	11/6
Redhills	8/-
Retreat	9/-
Rhoda Bridge	4/-
Richhill	6/-
Ringaskiddy	4/6
Robertstown	4/3
Rochestown	3/3
Rockcorry	6/3
Rooskey	7/-
Roscommon	9/6
Roscrea	8/6
Ross	9/-
Rosslare	5/-
Rossmore	8/3
Rossnowlagh	10/-
Rush and Lusk	3/3
Rushbrook	4/-
S.	
St. Anne's	2/9
Saintfield	2/9
St. Johnston	3/3
St. Mullins	5/8
Sallins	3/8
Sallybrook	4/9
Scariff	9/8
Scarva	6/3
Schull	8/6
Shankill	2/6

	Per Ton.
Shannon Bridge	8/–
,, Harbour	6/6
Shillelagh	6/–
Sion Mills	5/–
Sixmilebridge	9/6
Sixmilecross	7/6
Skerries	3/9
Skibbereen	8/3
Sligo	6/3
Smithborough	7/9
Sneam	8/9
Spa	8/6
Sparrowsland Sdg.	4/6
Staffordstown	6/6
Stewartstown	6/3
Strabane	3/3
Stranocum	6/–
Stranorlar	6/–
Streamstown	7/3
Swinford	11/6
T.	
Tallaght	1/–
Tallow Road	6/9
Tanderagee	4/6
Tarbert	10/–
Templemore	6/3
Templepatrick	3/9
The Lamb	2/9
Thomastown	5/6
Thurles	6/9
Timoleague	5/9
Tinahely	5/6
Tipperary	8/3
Toomebridge	5/9
Tower Bridge	2/9
Tralee	6/3
Tramore	2/9
Trew and Moy	5/6
Trillick	8/–
Trim	5/–
Tuam	10/6
Tubber	11/9
Tubbercurry	9/6
Tullamore	5/9
Tullow	7/–
Tullymurry	6/–
Tynan	6/3
U.	
Upperlands	7/3
Upton	4/–
V	
Valentia Harbour	10/–
Vernersbridge	5/3
Vicarstown	6/–
Victoria Bridge	5/3
Virginia Road	6/6
W.	
Warrenpoint	4/3
Waterfall	3/3
Waterford	1/3
Wellington Bridge	5/–
Westport	6/3
Westport Quay	6/3
Wexford	2/6
Whiteabbey	2/–
Whitehead	3/6
Wicklow	1/3
Wilkinstown	5/6
Woodenbridge	4/9
Woodlawn	9/6
Y.	
Youghal	6/–

The following are examples showing how manures may be valued by means of the Unit Prices given in this leaflet :—

1. Suppose the manure is guaranteed to contain "3·25 per cent. Nitrogen, 23 per cent. Soluble Phosphates, 8 per cent. Potash," its value at Ballybay would be reckoned thus :—

				£	s.	d.
Nitrogen,	3·25 per cent.	@	15/– per Unit,	= 2	8	9
Soluble Phosphates,	23 ,,	@	1/10 ,,	= 2	2	2
Potash,	8 ,,	@	4/6 ,,	= 1	16	0
Allowance for Mixing,				= 0	10	0
Special Allowance for Ballybay (see Statement)				= 0	5	9
Value per ton at Ballybay,				£7	2	8

2. Suppose the guaranteed analysis is "19 per cent. Soluble Phosphates, 1·5 per cent. Potash, 2·45 per cent. Nitrogen," the value of the manure at Tralee would be reckoned thus :—

				£	s.	d.
Soluble Phosphates,	19 per cent.	@	1/10 per Unit	= 1	14	10
Potash,	1·5 ,,	@	4/6 ,,	= 0	6	9
Nitrogen,	2·45 ,,	@	15/– ,,	= 1	16	9
Allowance for Mixing,				= 0	10	0
Special Allowance for Tralee (see Statement)				= 0	6	3
Value per ton at Tralee				£4	14	7

Farmers are advised to consult their County Agricultural Instructor before buying any manure if they are in doubt as to its value.

January, 1911.

MEMORANDUM.

MANURES RECOMMENDED BY THE DEPARTMENT FOR THE VARIOUS FARM CROPS.

OATS OR BARLEY.

A mixture of :—

1 part of Sulphate of Ammonia	which forms a complete manure, having an analysis of	2·75% Nitrogen.
3 parts of Superphosphate (35%)		15·00% Soluble Phosphates.
3 parts of Kainit		5·00% Potash.

To be applied at the rate of 5 cwt. per statute acre.

POTATOES.

A mixture of :—

1 part of Sulphate of Ammonia	which forms a complete manure, having an analysis of	3.25% Nitrogen.
4 parts of Superphosphate (35%)		23·00% Soluble Phosphates.
1 part of Muriate of Potash		8·00% Potash.

To be applied at the rate of 5 cwt. per statute acre, along with 15 tons dung.

TURNIPS.

Where a fair quantity of dung of good quality is available it will usually be found sufficient to use along with it 4 or 5 cwt. per statute acre of 35% Superphosphate.

Where the amount of dung is very limited the following mixture should be applied to this crop at the rate of 5 to 6 cwt. per statute acre :—

1 part of Sulphate of Ammonia	which forms a complete manure, having an analysis of	2·5% Nitrogen.
4 parts of Superphosphate (35%)		17·5% Soluble Phosphates.
3 parts of Kainit		4·5% Potash.

MEADOW HAY.

A mixture of :—

1 part of Nitrate of Soda	which forms a complete mixture, having an analysis of	3·0% Nitrogen.
2 parts of Superphosphate (35%)		14·0% Soluble Phosphates.
2 parts of Kainit		4·0% Potash.

To be applied at the rate of 4 or 5 cwt. per statute acre.

As these manures (meadow hay mixture) must not be allowed to stand after being mixed together, Agents and Farmers must get the ingredients separately. The manures must then be mixed on the farm and applied to the meadow the same day.

February, 1909.

[POSTER.]

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

APPLY

BASIC SLAG

TO

PASTURES

EARLY.

REFUSE INFERIOR BRANDS.

READ LEAFLET No. 22.

To be had FREE on application to
The Secretary, Department of Agriculture and
Technical Instruction for Ireland,
Upper Merrion Street, Dublin.

[POSTER.]

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

CAUTION.

MANURES.

FARMERS are WARNED that efforts are being made through
travelling and other agents in Ireland to effect Sales
of certain imported manures which though even
of the guaranteed analysis are of

VERY LOW VALUE.

Consult the County Instructor in Agriculture before buying any manures.

READ LEAFLET No. 17.

Which contains prescriptions for each crop,
to be had FREE from The Secretary, Department
of Agriculture and Technical Instruction for Ireland,
Upper Merrion Street, Dublin.

[POSTER.]

DEPARTMENT OF AGRICULTURE AND TECHNICAL
INSTRUCTION FOR IRELAND.

CAUTION.

CALF MEALS.

FARMERS

ARE

WARNED

THAT

INFERIOR AND EXPENSIVE CALF MEALS

ARE AT PRESENT BEING

SOLD IN IRELAND.

READ LEAFLET No. 54.

To be obtained FREE on application to
The Secretary, Department of Agriculture and
Technical Instruction for Ireland,
Upper Merrion Street, Dublin.

Letters so addressed need not be stamped.

RETURN giving particulars of a representative selection of Fertilisers analysed by the Department during the year ended 30th September, 1911.

Description of Fertiliser and County in which sample was drawn.	G=Vendor's Guarantee. A=Result of Analysis.	Phosphates.				Nitrogen.	Potash.	Observations. P—Price charged per ton V=Commercial Value "				
		Total.	Water Soluble.	Citric Soluble.	Insoluble.				£	s.	d.	
Basic Slag.												
Galway .	G	—	—	34	—	—	—	P	2	17	0	A sample of high grade slag. Price reasonable.
	A	—	—	34·36	—	—	—	V	3	6	4	
Antrim . .	G	—	—	34	—	—	—	P	3	0	0	Ditto.
	A	—	—	36·58	—	—	—	V	3	9	0	
Limerick .	G	—	—	33·6	—	—	—	P	3	8	0	Ditto.
	A	—	—	33·79	—	—	—	V	3	9	2	
Donegal .	G	—	—	28	—	—	—	P	3	0	0	A sample of medium-grade slag. Price reasonable.
	A	—	—	32·67	—	—	—	V	3	7	11	
Tipperary, S.R.	G	—	—	11	—	—	—	P	2	1	6	A low-grade inferior slag.
	A	—	—	16·12	—	—	—	V	1	15	3	
Superphosphate.												
Tipperary, S.R.	G	—	35	—	—	—	—	P	3	5	0	A high-grade superphosphate at a reasonable price.
	A	—	36·24	—	—	—	—	V	3	12	11	
Limerick .	G	—	35	—	—	—	—	P	3	10	0	Ditto
	A	—	34·51	—	—	—	—	V	3	9	6	
Wexford .	G	—	26	—	—	—	—	P	3	7	6	A medium - grade superphosphate. Price excessive.
	A	—	27·47	—	—	—	—	V	2	12	10	
Potassic Superphosphate.												
Londonderry,	G	—	23	—	—	—	4	P	3	7	6	A good sample.
	A	—	22·78	—	—	—	4·20	V	3	13	2	
Fermanagh, .	G	23	—	—	—	—	4	P	3	13	9	Ditto.
	A	—	23·73	—	—	—	3·91	V	3	19	10	
Kainit.												
King's, .	G	—	—	—	—	—	12	P	3	5	0	Ditto.
	A	—	—	—	—	—	12·50	V	3	3	0	
Sulphate of Potash.												
Down . .	G	—	—	—	—	—	48·65	P		—		Ditto.
	A	—	—	—	—	—	48·54	V	11	3	6	
Muriate of Potash.												
Waterford, .	G	—	—	—	—	—	50	P	10	1	3	Ditto.
	A	—	—	—	—	—	49·20	V	11	2	6	
Potash Manure Salts.												
Londonderry .	G	—	—	—	—	—	30	P	7	10	0	Medium-grade potash salt. Well up to guarantee. Price reasonable.
	A	—	—	—	—	—	34·80	V	6	1	10	
Sulphate of Ammonia.												
Galway .	G	—	—	—	—	16·75	—	P	14	12	6	A good sample.
	A	—	—	—	—	20·30	—	V	15	14	0	
Nitrate of Soda.												
Wexford, .	G	—	—	—	—	15·5	—	P	10	0	0	Ditto.
	A	—	—	—	—	16·10	—	V	12	4	0	

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Description of Fertiliser and County in which sample was drawn.	G—Vendor's Guarantee. A—Result of Analysis.	Phosphates.				Nitrogen.	Potash.	Observations. P=Price charged per ton V=Commercial Value "				
		Total.	Water Soluble.	Citric Soluble.	Insoluble.				£	s.	d.	
Calcium Cyanamide.												
Dublin, .	G	—	—	—	—	18	—	P		—		A good sample.
	A	—	—	—	—	19·60	—	V	14	14	0	
Nitrate of Lime.												
Dublin, .	G	—	—	—	—	12·75	—	P	9	15	0	Ditto.
	A	—	—	—	—	12·95	—	V	9	14	3	
Compound Manures.												
Potato Manure.												
Mayo, . .	G	—	23	—	—	3·25	3	P	7	6	0	A good sample of the mixture recommended by the Department.
	A	—	24·07	—	—	3·30	3·02	V	7	6	0	
Down, . .	G	—	15	—	2	1·23	1·08	P	4	5	0	Not specially suitable as a potato manure. Price excessive.
	A	—	11·89	—	4·25	1·54	1·02	V	3	4	9	
Mayo, . .	G	16	—	—	—	3·29	1·94	P	7	10	0	Very poor value for the price charged. Not a suitable mixture.
	A	10·20	8·80	—	—	3·40	1·89	V	4	15	5	
Down, . .	G	—	18	—	2·5	1·64	2·07	P	4	10	0	Slightly deficient in Soluble Phosphates. Price reasonable.
	A	—	16·65	—	—	1·75	3·45	V	4	7	6	
Wexford, .	G	—	10	—	4	1·35	1·10	P	5	10	0	A highly-priced mixture not specially suitable for potatoes.
	A	—	12·98	—	5·03	1·57	1·44	V	3	3	10	
Galway, .	G	—	10	—	—	3·29	3	P	7	10	0	Deficient in Nitrogen and Potash. Price exorbitant.
	A	—	11·53	—	—	2·60	2·56	V	4	13	0	
Cavan, . .	G	—	15	—	—	1·65	3	P	4	9	0	Slightly deficient in all three constituents. Not very good value.
	A	—	14·38	—	—	1·47	2·96	V	3	18	3	
Turnip Manure.												
Mayo, . .	G	—	16	2	—	2·5	4·5	P	5	0	9	A good sample at a reasonable price of the mixture recommended by the Department.
	A	—	13·97	—	—	2·70	4·60	V	5	6	0	
Wexford, .	G	—	16	—	4	·32	—	P	4	15	0	Not specially suited for turnips. Price excessive.
	A	—	19·27	—	—	·90	—	V	3	2	1	
Galway, .	G	—	22	—	8	1·64	—	P	7	10	0	Price out of all proportion to commercial value.
	A	—	26·39	—	4·61	1·74	—	V	4	15	0	
Mayo, . .	G	20	—	—	—	2·88	1·62	P	7	10	0	Ditto.
	A	22·20	12·80	—	—	2·06	2·08	V	4	12	6	
Mangel Manure.												
Donegal, .	G	—	10	2	—	3·75	4·75	P	5	5	0	A good sample of the mixture recommended by the Department. Price reasonable.
	A	—	12·40	—	—	3·78	4·83	V	5	12	5	
Galway, .	G	—	14	—	2	2·47	1·35	P	7	10	0	Below guarantee in Soluble Phosphates. Price excessive.
	A	—	11·52	—	—	3·36	3·00	V	5	5	6	
Limerick, .	G	—	15	—	2	1·65	3·51	P	5	0	0	Slightly deficient in Potash, but well up to guarantee in the other constituents.
	A	—	17·07	—	—	1·75	3·43	V	4	10	9	

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Description of Fertiliser and County in which sample was drawn.	G=Vendor's Guarantee A=Result of Analysis.	Phosphates.				Nitrogen.	Potash.	Observations.				
		Total.	Water Soluble.	Citric Soluble.	Insoluble.			P=Price charged per ton V=Commercial Value „				
									£	s.	d.	
Oat and Grass Manure. Galway, .	G	—	15	—	—	2·75	5	P	5	10	0	A sample of the mixture recommended by the Department. Price moderate.
	A	—	15·84	—	—	2·63	5·15	V	5	15	5	
Cavan, . .	G	—	18	—	2	·82	—	P	4	13	9	Not specially suitable for grass. Price rather excessive.
	A	—	17·57	—	—	·91	—	V	3	2	5	
Barley Manure. Carlow, .	G	—	17·89	—	3·95	1·65	83	P	7	6	0	Price almost double commercial value.
	A	—	14·94	—	5·26	2·00	1·08	V	6	13	2	
Universal Manure. Wexford. .	G	20	16	—	—	·62	—	P	4	0	0	A low-grade compound at an excessive price.
	A	22·64	15·79	—	—	·64	—	V	2	18	6	
All-round Manure. Wexford, .	G	18	14	—	—	·82	—	P	3	15	6	Ditto.
	A	19·98	14·94	—	—	·91	—	V	2	11	1	
Equalised Manure. Galway, .	G	—	—	—	25	5·59	1 50	P	6	16	3	A rather expensive mixture.
	A	—	—	—	28·31	0·55	1·71	V	6	2	7	
Blood and Bone Manure. Tipperary, N.	G	—	—	—	—	—	—	P	2	3	0	This is not a bone compound. It consists of sand, brick dust and kainit. Its extreme value is £1 0s. 9*d*. Such a low-grade mixture would not bear cost of carriage.
	A	traces	none	—	—	·60	3·42	V		—		
Bone Manure. Antrim, .	G	*52	—	—	—	·82	1·82	P	6	5	0	Not very good value for the price.
	A	44·12	none	34·35	—	1·89	·92	V	4	12	6	
Dissolved Bone Compound. Donegal, .	G	—	20	—	5	1·03	—	P	3	8	9	A sample of ordinary Bone Compound. Price reasonable.
	A	—	20·65	—	8·25	1·08	—	V	3	5	4	
Blood Manure Compound. Waterford .	G	—	10	—	6	1·03	—	P	2	16	9	Fair sample of a medium-grade compound.
	A	—	12·56	—	7·83	1·08	—	V	2	11	8	
Raw Peruvian Guano. Waterford, .	G	60	—	—	—	5·76	2	P	8	10	0	A very highly-priced guano.
	A	28·27	2·93	—	—	5·74	2·05	V	5	11	11	
Equalised Guano. Mayo, . .	G	20	—	—	—	8·60	2	P	8	7	6	A good sample of guano, though deficient in Potash.
	A	35·38	—	22·78	—	0·51	1·16	V	7	11	9	

* Guaranteed practically all soluble.

RETURN giving particulars of a representative selection of Feeding Stuffs analysed by the Department during the year ended 30th September, 1911.

Description of Feeding Stuff and County in which sample was drawn.	G=Vendor's Guarantee. A=Result of Analysis.	Oil.	Albuminoids.	Price charged.	Observations
Crushed Flaxseed.					
Kilkenny,	G	—	—	9/4 per st.	Sample badly crushed and contains over 3% sand.
	A	34·05	—		
Do.	G	—	—	3 2 per st.	Rather low in oil and badly crushed; otherwise in good condition.
	A	29·14	24·36		
Calf Meals.					
Monaghan,	G	5·36	15·31	15/– per 2 cwt.	Chiefly composed of hop refuse, contains traces of rice, cotton seed and locust bean meals. Mites are present.
	A	4·84	16·80		
Kildare,	G	—	—	18/– per cwt.	Not a suitable calf food. Contains bran, oat shudes, maize, oat and pea meals Mites and maggots are present. Price excessive.
	A	4·92	21·00		
Limerick,	G	14	13	15/– per cwt.	Seriously below guarantee in oil. An unsuitable calf food. Price excessive.
	A	8·89	14·70		
King's,	G	5	18	17/– per cwt.	In poor condition, containing mites. Very poor value for the price charged.
	A	4·30	16·37		
Mayo,	G	—	—	12/6 per cwt.	Found, as stated, to be made according to the formula given in Department's Leaflet No 54. Flaxseed should be better crushed. In good condition.
	A	11·52	16·62		
Roscommon,	G	3·85	23·62	2/9 per st.	An unsuitable mixture. Price exorbitant.
	A	5·50	21·84		
Kilkenny,	G	5	16	7/6 per cwt.	Below guarantee in oil Contains mites, and is totally unfit for calf-feeding purposes.
	A	2·16	18·37		
Tipperary, S.	G	—	—	12/3 per cwt.	Found, as stated, to be made according to the formula given in Department's Leaflet No. 54. A good sample.
	A	—	—		
Cork,	G	—	—	12/6 per cwt.	Ditto. Flaxseed should be better crushed.
	A	10·02	13·99		
Galway,	G	10	17	14/6 per cwt.	A good sample.
	A	12·25	19·83		
Cavan,	G	—	—	11/– per cwt.	A good sample of a meal made in accordance with the formula given in Department's Leaflet No. 54.
	A	11·53	15·75		
Kilkenny,	G	14	20	16/– per cwt.	A good sample.
	A	14·08	21·78		
Cork,	G	6	18	17/– per cwt.	Not a suitable calf-food. Price excessive.
	A	8·21	17·94		
Limerick,	G	6	13	£12 10s. per ton.	Unfit for calf-feeding.
	A	8·29	18·37		

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Description of Feeding Stuff and County in which sample was drawn.	G – Vendor's Guarantee. A – Result of Analyses.	Oil.	Albuminoids.	Price charged.	Observations.
Kilkenny, .	G	5	16	17/8 per cwt.	An exorbitant price for a meal of this description.
	A	5·26	16·85		
Westmeath, .	G	5	20	24/– per cwt.	Price charged out of all proportion to value.
	A	5·02	17·50		
Linseed Cake Meals.					
Monaghan, .	G	6	28	£9 15s. 3d. per ton.	Sample up to guarantee.
	A	8·19	28·00		
Roscommon, .	G	—	—	10/– per cwt.	A poor sample, contains 10% weed seeds.
	A	7·76	27·60		
Kilkenny, .	G	6	32	12/– per cwt.	Slightly deficient in content of oil.
	A	5·65	32·37		
Tipperary, S.R.,	G	9	30	11/– per cwt.	Deficient in content of albuminoids.
	A	10·39	28·00		
Down, . .	G	9	30	9/6 per cwt.	A good sample.
	A	10·16	33·13		
Cotton Seed Meals.					
Cork, . .	G	10	26	—	Do.
	A	10·21	38·64		
Tipperary, S.R.,	G	8	43	£9 per ton	Do. slightly deficient in content of oil.
	A	8·47	46·64		
Pig Meals.					
Louth, . .	G	3	12	£6 15s. per ton	Made of stale and damaged materials.
	A	3·36	12·25		
Dublin, . .	G	11	15	£10 per ton	An expensive mixture.
	A	10·47	14·63		
Queen's, . .	G	6	13	£6 7s. 6d. per ton	Made of wheat offal, maize, rice, meal and weed seeds.
	A	6·35	13·12		
Feeding Wheat Meal.					
Antrim, . .	G	4·2	13·37	8/– per cwt.	Contains wheat, bran, rice meal and weed seeds
	A	2·74	15·39		
Oil Cake Meal.					
Queen's, . .	G	10	20	£7 12s. 6d. per ton	Contains an excessive quantity (3·09%) of sand.
	A	9·52	20·56		
Soya Bean Meal.					
Down, . .	G	6	48	£6 15s. per ton	A good sample, though slightly deficient in albuminoids.
	A	6·45	46·10		
Feeding Meal.					
Clare, . .	G	7	27	£9 15s. per ton	Made of linseed cake meal with 10% rice meal.
	A	7·16	28·25		

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Description of Feeding Stuff and County in which sample was drawn.	G—Vendor's Guarantee. A—Result of Analysis.	Oil.	Albuminoids.	Price charged.	Observations.
Dairy Meal.					
Wexford, . .	G	7	18	£7 15s. per ton	Sample up to guarantee.
	A	7·30	18·48		
Linseed Cake.					
Monaghan, .	G	8	28	£9 15s. 6d. per ton	Commercially pure.
	A	8·99	30·62		
Dublin, . .	G	9	30	10/– per cwt.	Do.
	A	10·16	28·44		
Queen's, . .	G	10	31	—	A good sample.
	A	10·10	32·56		
Decorticated Cotton Cake.					
Waterford, .	G	9	40	£7 15s. per ton	Sample slightly deficient in oil.
	A	8·32	42·00		
Wexford . .	G	8	40	£8 10s. per ton	Below guarantee in content of oil.
	A	5·50	41·12		
Kilkenny, .	G	8	40	10/– per cwt.	A good sample.
	A	9·22	40·25		
Undecorticated Cotton Cake.					
Armagh, . .	G	5	23	£5 17s. 6d. per ton	A good sample.
	A	6·31	22·75		
Soya Cake.					
King's . .	G	6	43	£7 10s. per ton	Slightly deficient in oil and albuminoids.
	A	5·70	42·00		
Extracted Soya Cake.					
Tyrone, . .	G	1	44	—	A good sample.
	A	·98	46·38		
Fattening Cake.					
Mayo, . .	G	9	19	8/– per cwt.	In stale condition with hard lumps, contains cotton seed, pea and rice meals, weed seeds and ground weevils.
	A	8·97	22·68		
Waterford, .	G	10	20	£6 10s. per ton	Made of inferior materials and in stale condition. Contains 25% weed seeds.
	A	7·94	20·12		
Queen's, . .	G	10	20	£6 10s. per ton	Made of inferior materials and in stale condition. Contains mites and an excessive quantity (2·44%) of sand.
	A	9·06	21·00		
Feeding Cake.					
Waterford, .	G	11	25	£8 15s. per ton	Made of impure linseed cake, contains oat shudes and 10% weed seeds.
	A	11·45	24·93		
Cod Liver Oil Condiment.					
Queen's, . .	G	13·28	15·03	34/– per cwt.	Contains some fish liver oil. Price exorbitant.
	A	13·96	15·94		

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Description of Feeding Stuff and County in which sample was drawn.	G = Vendor's Guarantee. A = Result of Analysis.	Oil.	Albuminoids.	Price charged.	Observations.
Preparations containing Treacle or Molasses.					
Dublin, . .	G	3·05	8·37	£6 10s. per ton	Absorbent principally hop refuse. Contains 57·5 % carbohydrates.
	A	3·06	7·64		
Londonderry .	G	·5	16·20	£6 15s. per ton	Contains 40·9% carbohydrates, and is composed of treacle, rice bran, linseed cake meal, weed seeds, ground weevils and limestone.
	A	2·68	16·18		
Antrim, . .	G	·75	7·5	£6 15s. per ton	Contains 59·9% carbohydrates.
	A	·65	7·02		
Down, . .	G	·2	2	5/– per cwt.	Contains 69·6% carbohydrates.
	A	·57	1·75		

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION STREET,
DUBLIN, *December*, 1909.

No. 23263/'09.

WEEDS AND AGRICULTURAL SEEDS (IRELAND) ACT, 1909.

SIR,

I have to inform you that the above Act, which has just been passed, will come into force on 1st January, 1910. The Department desire to bring under the notice of all persons engaged in the sale of agricultural seeds in Ireland the main provisions of the Act so far as they relate to such seeds.

The object of Part II. of the Act briefly is to enable the Department to exercise over the trade in agricultural seeds a supervision similar to that exercised by them in the case of artificial manures and cattle foods under the Fertilisers and Feeding Stuffs Acts, 1906.

It is as essential for the proper cultivation of crops that pure seeds and seeds of high germination should be obtainable as that good manures should be used. The Department are, however, aware that in some districts large quantities of seeds of very inferior quality are being sold. In many cases the sweepings of hay lofts, containing the seeds of weeds, are sold as grass seeds. In other cases old seeds, seeds that have been badly saved or are otherwise defective, are purchased and resold because of their apparent cheapness by local shopkeepers who, in most cases, do not realise that this course inflicts a grievous injury upon the agriculture of the district. The injury comes not only through the loss of crop, but, by reason of the impurities contained in the seed, the prevalence of weeds amongst the crops is greatly increased.

The Act has, therefore, been passed with a view to putting a check on the use of seed of this description. The undermentioned Sections which apply specially to seeds are quoted in full for the information of those concerned in the trade:—

> *Section* 5 (1). Any officer of the Department shall have power at all reasonable hours to enter the shop, store, or other premises of any person who sells or exposes or keeps for sale agricultural seeds for sowing, and to examine and take samples of any agricultural seeds that are upon the premises.
>
> (2). The person on whose premises a sample of agricultural seeds is taken under this Section shall, if the officer requires, give the name and address of the person from whom he procured the seeds; and if he refuses to give such name and address. or wilfully gives a false name or address, he shall be guilty of an offence under this Act, and shall be liable on summary conviction to a penalty not exceeding Ten Pounds.
>
> *Section* 6. The Department may cause any sample of agricultural seeds taken under this Act to be tested for purity and germination, and may publish in such manner as they think fit the results of the tests and the names and addresses of the persons upon whose premises the samples were taken, and of the persons from whom the seeds were stated to have been procured.

In Part III. of the Act "agricultural seeds" are defined as meaning the seeds of grass, clover, flax, cereals, turnips, rape, mangel, carrots, cabbage, or parsnips.

The seeds of all grasses that may be sold for agricultural purposes are covered by the Act. There are, however, only seven grasses that need concern the agriculturist, viz.: Perennial Rye, Italian Rye, Cocksfoot, Timothy, Meadow Fescue, Meadow Foxtail and in special cases Crested Dogstail. The Department do not recommend the use of any others, and, accordingly, they propose to confine their attention to this series almost exclusively. Shopkeepers would do well to stock no others. The use of each variety is described in leaflet No. 42, of which a copy is enclosed.

As already stated, the Act will come into operation on the 1st January next, after which date the Department's agricultural officers will be instructed to take samples of seeds which will be tested at the Department's Seed Testing Station with a view to ascertaining, for publication if thought desirable, the quality and source of the seeds sold locally. It, therefore, behoves all engaged in the retail of seeds for sowing to give special attention in future to this side of their business.

Merchants, shopkeepers and others will be buying their stock of seeds for the ensuing season very shortly, and the Department would strongly impress upon them the need for ensuring that they purchase none but the best. They should get a guarantee from the wholesale firm of seedsmen with whom they deal that the seeds are fresh, pure, true to name, and of a high germinating power. The Department do not intend to administer this measure in any harsh spirit, but if the above advice is disregarded shopkeepers and others can have no cause for complaint if the powers conferred upon the Department under the Act are exercised to the fullest extent.

It should be to the interest of those engaged in the seed trade, as well as of farmers, to place and maintain the trade in this country on a high level in every respect, and the Department feel confident that in their efforts to secure this very desirable result they may rely upon the active co-operation of all vendors of agricultural seeds.

As mentioned above, a good deal of the harm is due to want of technical knowledge of seeds and their properties. With a view to assisting those engaged in the trade to improve their knowledge in this respect, the Department hope at a future period to make provision, if there is a sufficient demand for it, for some local technical instruction on this subject for traders and their apprentices. A communication will be made on this subject at a later date.

I am, Sir,
Your obedient Servant,
T. P. Gill,
Secretary.

To the Person or Firm
named in the Address.

Department of Agriculture and
Technical Instruction for Ireland,
Upper Merrion Street,
Dublin, *January*, 1911.

No. 24306/1910.

WEEDS AND AGRICULTURAL SEEDS (IRELAND) ACT, 1909.

Sir,

As intimated in the circular-letter in regard to the provisions of Part I. of the above Act, addressed to you by the Department in December, 1909, instructions were given to the Department's agricultural officers to sample the stocks of seed exposed for sale in the shops and stores of merchants engaged in this trade. Large numbers of samples so taken were tested for purity and germination at the Department's Seed Testing Station. The results of these tests show that at least 65% of the seeds sampled were distinctly unsatisfactory for agricultural purposes. The Department are empowered under the Act to publish, in any manner they think fit, the results of such tests, giving the names and addresses of the persons upon whose premises the samples were taken, and those of the persons from whom the seeds were stated to have been procured. They are, however, reluctant to exercise this power at the present stage, but would warn all persons engaged in the sale of agricultural seeds that, if quantities of seeds of an unsatisfactory nature continue to be sold in future seasons, they will be obliged to publish, without further notice, the results of the tests, with full particulars as above mentioned.

The Department would once more appeal to all vendors of agricultural seeds to co-operate with them in their efforts to place and maintain the trade in this country on a high level in every respect.

It is felt that much could be effected towards this end if merchants would exercise greater care in the selection of seeds, and would absolutely decline to stock inferior stuff, such as old seeds remaining over from previous seasons, "mixed grass seed," the sweepings of hay lofts and stores, and the cleanings derived from superior qualities of seed and sold under various names, such as "White Hay," "Brown Hay," "Common Hay," etc. It is recognised that in many districts there is a demand on the part of farmers for seed of this description owing to its apparent cheapness. The Department are endeavouring to remove this mistaken idea by demonstrating to farmers that such mixtures are really much more costly in the end than first-class seed sold at a higher price, not only on account of the poor crop results obtained, but also by reason of the quantities of weed seeds contained in them.

Merchants, shopkeepers, and others will be buying their stock of seeds for the ensuing season very shortly, and the Department would strongly impress upon them the need for ensuring that they are supplied by the wholesale firms with none but the best. They should request the wholesale firm with whom they deal to supply them with a statement of the percentages of purity and germination of the seeds offered for sale. Most of the principal firms in the trade in Ireland have intimated to the Department their willingness to give such statements in respect of the seeds sold by them. Should the firm with whom you have been dealing decline to comply with your request, the Department will supply, on application, a list of firms in this country who are prepared to give such statements to their customers.

I am, Sir,
Your obedient Servant,
T. P. GILL,
Secretary.

To the Person or Firm
Named in the Address.

A.B. MEMO No. 14.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

SEED TESTING.

MEMORANDUM FOR INFORMATION OF RETAILERS OF AGRICULTURAL SEEDS.

The attention of the Department having recently been drawn to certain difficulties which occur in the interpretation of the results of tests of agricultural seeds made at various seed testing stations, the following memorandum is issued with a view to making matters clear on this subject.

The difficulties alluded to are concerned almost exclusively with the seeds of grasses, and, to a lesser degree, those of clovers, and arise from the fact that the results of tests made at the Department's Seed Testing Station of samples of such seeds do not always closely coincide with those obtained for similar samples at other seed testing stations, particularly some of the more widely known stations on the Continent.

It may be stated at once that the differences in question are not necessarily due to inaccuracies in the actual tests made at these stations, but they depend on the fact that the *principles* upon which the methods of testing are based are not everywhere the same.

The Department lay great stress on the fact, which is frequently overlooked, that a correct idea of the quality of a sample of seed cannot be obtained from a knowledge of the percentage of germination (or "growth") alone, but that the purity of the sample must also be taken into consideration (see Leaflet No. 59, The Testing of Farm Seeds). It is, however, of little use to know what the percentage of purity of a sample is stated to be unless the meaning of the term "purity" is first clearly defined and agreed upon.

At the Department's Station all the seeds in a sample which are or purport to be of the kind of which the sample is stated to consist are regarded as pure seed, and the percentage weight of such seeds present in the sample constitutes the percentage of purity of that sample. The impurities (which are removed from the sample with scrupulous care during the carrying out of the purity test) consist of foreign matter such as sand, dirt and other debris, as well as of the seeds of plants, whether weeds or otherwise, other than those of the particular kinds specified in the designation of the sample.

At many Continental and other seed testing stations the definition of what constitutes the pure seed in samples of some kinds of grass seeds coincides with that adopted by the Department, but it is applied only in the case of certain very small seeds such as those of some of the Meadow Grasses (Poas) and other seeds which are not commonly or largely used in the ordinary routine of farming in Ireland, and which the Department do not undertake (except in special circumstances) to test. With regard to the larger and more ordinary grass seeds, however, such as those of the Rye Grasses, Cocksfoot, etc., most of the stations referred to have adopted an entirely different method of determining their purity, based upon a totally different idea as to what the impurities in the sample consist of. Not only are the real impurities, as defined above, treated as such, but so are also all those seeds in the sample which do not possess or appear not to possess a kernel, or "caryopsis" as it is technically called, in spite of the fact that these seeds are of the kind named in the description of the sample. It follows, therefore, that when this method is employed for carrying out a purity test the weight of the impurities in a given sample must be greater (and, therefore, the percentage of purity *less*) than when the same sample is analysed for purity according to the principles adopted by the Department. In other words, the results of the tests made at the Department's Seed Testing Station of samples of such kinds of grass seeds tend always to be *higher* as regards percentage of purity than those obtained where what may be called the "continental" method is adopted, a fact which has commonly been ignored completely by those who have been foremost in complaining of discrepancies in the results of seed analyses. Since, however, the seeds necessary for the germination tests are taken, at all stations alike, from the seed after the impurities (however they may be defined) have been removed, it will be evident that not only are differences in the percentages of purity involved, but different results are also bound to follow in the percentages of germination. For when, as in the "continental" method of purification, the real impurities in a sample have first been removed, and when to them the empty or presumably empty seeds have been added, there remains a quantity of *selected* seed, from which the requisite number of seeds for the germination test are taken. It stands to reason that the percentage of germination of such seeds must be higher, in many cases considerably higher, than would be the case if the seeds for the germination test were taken from the seed after the real impurities only had been removed. Hence the percentages of germination obtained by the "continental" methods always tend to be higher than those obtained for the same samples by the methods employed at the Department's Seed Testing Station.

It will be evident, therefore, that it is absolutely necessary when comparing the percentages of germination and of purity obtained by different seed testing stations for the same or similar samples of seed, to ascertain whether the principles underlying the methods of testing adopted by the stations in question are identical, otherwise comparison of numerical results is useless. In general the results given by the Department's Seed Testing Station for the classes of seeds mentioned cannot be strictly compared with those given by most of the continental and other stations, although in both cases the results, when considered separately, may give a correct indication of the quality of the seed, but from different points of view.

As regards the question of the accuracy with which the actual tests are carried out, it may be stated that at the Department's Station a method of control is employed which secures that the results shall be as absolutely reliable as possible, and which, so far as is known, is not in vogue at any other station in the world. This consists in the testing for germination, at the same time, and side by side with the sample being tested, of a check or "control" sample of the same kind of seed, the behaviour of which is already well known from previously repeated testings. Should such control not germinate up to the required standard, the test is rejected and a fresh one made. By this means it is possible to secure that the actual conditions under which each germination test is carried out shall be correct.

As may be supposed, the Department would not deliberately have adopted and employed for more than ten years the principle upon which their methods are based without a very careful consideration of the matter in all its bearings, and without possessing strong reasons in support of their procedure. Some of these are as follows :—

1. In the case of seeds of the highest quality the proportion of ampty individuals in the sample is but small, and the Department's method of testing gives the high results characteristic of such seeds, and these differ but little, if at all, from those obtained by the "continental" method.

2. In general, in judging a sample of seed, more stress is apt to be laid by the merchant or farmer on its percentage of germination than on its percentage of purity. It is, therefore, desirable that the quality of the seed should make itself evident and find clear expression in the percentage of germination. This is the case where the Department's method of testing is employed, but less so where the continental method is adopted.

3. By the Department's method the *actual seed as supplied to the farmer*, and as it will be sown by him, is tested for germination, whereas by the continental method *selected seed* is employed for this test, and, consequently, the percentage of germination of a sample of second or even third class quality of seed may appear to be high, and may, if germination mainly be taken into account, give quite an erroneous idea of the quality of the seed.

4. Another reason in favour of the Department's method lies in the fact that it is quite impossible to distinguish with accuracy in every case (even with the help of the best optical appliances available) between an "empty" and a "filled" grass seed, the fact being that no such strict line of division actually exists, "filled" seeds being connected with "empty" seeds by a series of gradations of intermediate forms. The Department's method totally avoids this cause of inaccuracy.

5. The separation of "empty" from "filled" seeds as carried out by the continental method must of necessity be dependent largely upon the individuality of the person making it. The Department, apart altogether from the undesirability of testing only *selected* seeds for germination, claim that by the method adopted by them the personality of the tester is entirely eliminated.

6. According to the Department's principle there is but one, and only one, idea underlying the term "purity." On the continental principle the idea of "purity" differs according as to whether samples of the larger grass seeds are under consideration or those of the smaller ones, an illogical position to assume.

It may be useful to consider briefly to what extent concordant results may reasonably be expected from successive tests of the same sample, or of similar samples from the same bulk, made at the same seed testing station, or at two or more stations where identical methods of testing are practised. *Absolutely identical* results as regards purity and germination are of course entirely out of the question, because it is quite impossible to take successive portions from a sample each of which shall possess exactly the same numerical proportion of living to dead seeds as the others, and as are contained in the whole sample itself. The chances of variation are greatest when the proportions of living to dead seeds are numerically equal in the sample, and they diminish by degrees according as the proportion of the living or the dead seeds respectively increases. Hence it follows that the unavoidable variations in the results of germination tests will be *least* when the seeds are of the very highest germinating quality, and also when they are of the very worst. On the other hand, these differences will be *greatest* in those inferior samples which contain living and dead seed in about equal proportions. These variations exist quite independently of the actual experimental details of the tests themselves, the accuracy of which may be assumed as complete.

From mathematical considerations, combined with the actual results obtained in large series of tests, it is possible to estimate very closely the degree of variation which may reasonably be expected to occur at any given percentage of germination between two or more such tests of a sample of seed carried out at the same station, or at two stations where identical methods of testing are employed, and these variations can be tabulated and will then serve as a table of latitudes. Up to the present, however, no such table has been formulated as universally applicable to all seed testing stations, and the Department have no intention of prescribing definite limits of variation, but the accompanying table is given as an example of one which has met with wide acceptance.

TABLE OF LATITUDES.

When the percentage of germination is, or lies between	The latitude above or below this percentage of germination allowable between two tests is
99·9 and 95	4·2
94·9 ,, 90	5·7
89·9 ,, 85	6·2
84·9 ,, 80	7·7
79·9 ,, 75	8·3
74·9 ,, 70	8·8
69·9 ,, 65	9·1
64·9 ,, 60	9·4
59·9 ,, 55	9·4
54·9 ,, 50	9·6

Where tests are made of two or more different samples from the same bulk, the differences may be expected to be greater, and they will depend almost entirely upon the care exercised that the samples are taken in such a way that each of them shall be really representative of the whole bulk. Where tests are made by two or more stations, not employing the same methods of testing, comparison of the results of the tests even of one and the same sample is quite useless.

Before making any complaints, therefore, as to lack of concordance between the results of germination tests, those concerned should first consider such a table as this, and ascertain whether the differences fall within reasonable limits.

In regard to the results of tests of clover seeds, a difficulty sometimes crops up in connection with what are known as "hard" seeds. A certain percentage of the seeds of clovers (and of other leguminous plants), owing to the impervious nature of their seed coats, do not absorb water or become soft during the germination test, but remain small and hard, and do not germinate within the time allotted to the test. Although the presence of a considerable proportion of hard seeds is an undesirable feature in a sample, yet all of such seeds are not necessarily to be regarded as useless, for some of them may germinate after a time when they are sown in the soil. It is customary at some seed testing stations (and this is the case at the Department's Station) to state separately in the report on the sample the actual percentage of germination of the seed, and the percentage of hard seeds present in the sample, and this is to be regarded as the most desirable practice. At other stations a proportion of the percentage of hard seeds is added to the actual percentage of germination, so that the total is increased. The proportions added are frequently one-half the percentage of hard seeds, in the case of Red Clover, and one-third of it in White and Alsike Clovers. In comparing the results of tests of clover seeds, therefore, it is necessary to ascertain whether a proportion of the hard seeds has been added to the actual percentage of germination or not before drawing any conclusions. Means have been found and are successfully employed by some seed houses to get rid of hardness in clover seeds, so that in the samples of clover seed supplied by such houses hard seeds are absent or practically so. The proportion of hard seeds present varies with the kind of clover and also with the season, but average numbers for Red Clover may be reckoned as about 8 per cent., for Alsike Clover 9 per cent., and for White Clover 13 per cent.

With regard to clover seeds also the personal element of the tester comes into play in the case of some continental and other stations. Samples of these seeds frequently contain considerable quantities of small and shrivelled seeds. These seeds are, of course, true clover seeds, and at the Department's Station they remain with the pure seed from which the seeds for the germination test are taken, and are not considered as impurities. At some of the other stations, however, such small and wrinkled seeds (which, of course, germinate very badly, or not at all) are removed and treated as impurities, and, consequently, the germination test is carried out, just as in the case of grass seeds, on *selected* seed, and the results are necessarily higher, while the percentage of purity is lower. The results, therefore, depend upon the judgment of the tester, who has to decide whether a clover seed is good enough to be selected for germination, or whether it must be regarded as sufficiently small or inferior to justify its classification as an impurity. By the Department's method this uncertainty is completely eliminated and accuracy ensured.

When purchasing seeds farmers should ask for statements or guarantees as to the percentages of purity and germination of them. It is, furthermore, highly desirable that in the case of grass and clover seeds particularly, they should insist that such statements should be based on tests carried out by the Department's Seed Testing Station, or on tests in which their methods of testing are employed. In particular they should not be led away by the apparently high-looking results of germination tests, often given in connection with seeds offered for sale, but determined according to continental methods in which only *selected* seed is used for the germination test, as such numbers often convey an erroneous impression of the value of the seed for sowing purposes.

TABLE showing the number of Samples of Seeds tested under the Act from each County during the years 1910 and 1911, and the number of each found to be unsatisfactory.

COUNTY	TESTED			UNSATISFACTORY		
	1910	1911	Total	1910	1911	Total
Antrim ..	6	32	40	5	10	16
Armagh ..	15	16	31	7	4	11
Carlow ..	3	7	10	1	2	3
Cavan ..	12	11	23	12	5	18
Clare ..	46	28	74	35	15	51
Cork ..	30	83	113	24	49	73
Donegal ..	27	16	43	14	6	20
Down ..	8	13	21	4	3	7
Dublin ..	4	12	16	2	2	4
Fermanagh ..	12	18	30	7	7	14
Galway ..	17	31	48	16	25	41
Kerry ..	33	71	104	28	60	88
Kildare ..	10	6	15	9	3	12
Kilkenny ..	16	20	36	6	12	20
King's County ..	13	12	25	4	3	7
Leitrim ..	25	24	49	20	18	36
Limerick ..	19	7	25	12	4	16
Londonderry ..	23	6	29	10	3	13
Longford ..	0	6	6	0	4	4
Louth ..	18	15	33	11	7	18
Mayo ..	31	40	71	29	30	69
Meath ..	1	3	4	1	3	4
Monaghan ..	2	6	6	2	2	4
Queen's County ..	23	6	29	10	4	14
Roscommon ..	11	32	43	10	30	40
Sligo ..	4	22	26	3	14	17
Tipperary ..	23	25	48	5	4	10
Tyrone ..	7	13	20	5	5	10
Waterford ..	12	60	72	5	31	35
Westmeath ..	12	7	19	10	1	11
Wexford ..	15	22	37	7	8	15
Wicklow ..	19	13	32	8	6	14
Totals	498	662	1,180	327	381	708

Table showing the number of Samples of each of the various kinds of Seeds tested under the Act during the years 1910 and 1911, the number of unsatisfactory samples of each kind, and the average percentages of purity and germination of the unsatisfactory samples.

Name of Seed	1910				1911			
	No. tested	Unsatisfactory			No. tested	Unsatisfactory		
		No.	Av. % Purity	Av. % Germn.		No.	Av. % Purity	Av. % Germn.
Perennial Rye	130	**97**	81·9	44	231	**167**	84·2	43
Italian Rye ..	89	**74**	92·4	48	111	**62**	93·9	50
Cocksfoot ..	44	**30**	90·9	48	43	**23**	87·9	48
Meadow Fescue	15	**9**	96·8	39	9	**5**	89·3	36
Timothy ..	20	**1**	—	—	35	**8**	91·4	54
Meadow Foxtail	7	**7**	88·1	31	7	**7**	93·0	31
"Hay Seed"	31	**31**	46·7	13	30	**30**	70·1	28
Red Clover ..	92	**40**	87·7	61+4 h. [2]	110	**17**	91·2	53+6 h.
White Clover	25	**20**	88·3	46+7 h.	27	**25**	86·1	46+13 h.
Alsike Clover	26	**5**	92·5	45+9 h.	30	**5**	89·7	48+10 h.
Trefoil ..	12	**12**	88·9	30+3 h.	17	**16**	91·9	33+6 h.
Mangel ..	2	**1**	—	—	18	**13**	99·9	56
Miscellaneous[3]	5	**0**	—	—	14	**3**	97·7	63

[1] Including "White Hay," "Brown Hay," "Common Hay," "Hey," "Grass Seeds" and "Mixtures." The higher averages of purity and germination in 1911 are largely due to the fact that credit was given in that year for the seeds of Yorkshire Fog present in the samples which in 1910 were regarded as an impurity.

[2] h.="hard" seeds remaining sound but ungerminated at the conclusion of the test.

[3] Includes samples of Crested Dogstail (4), Swede, Turnip and Cabbage (18) and Flax (2).

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